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Hard Red Spring Wheat Quality Report

Physical, Chemical, Milling, and Baking Characteristics

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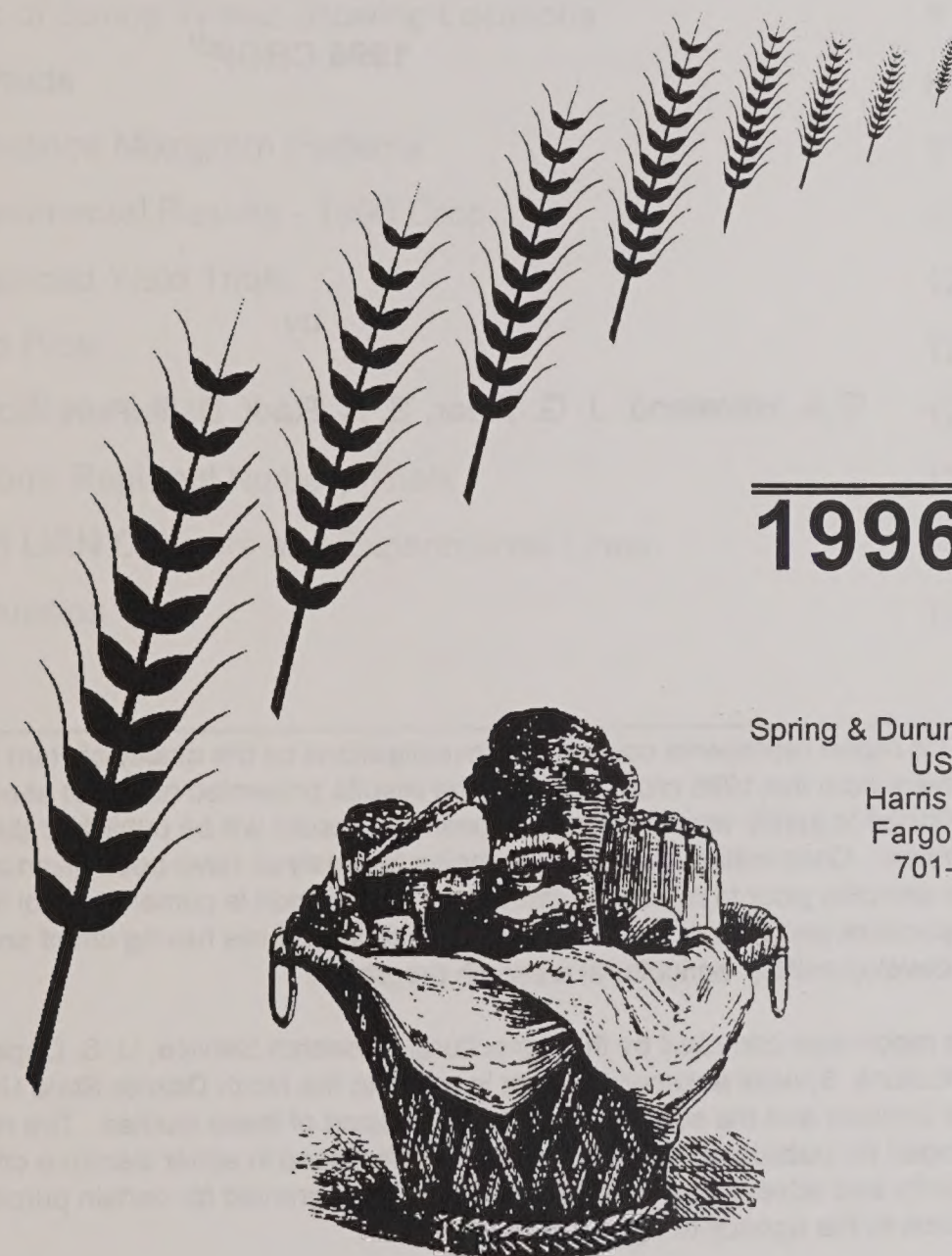


1996 Crop

United States Department of Agriculture
Agriculture Research Service
RRVARC, Fargo, North Dakota

Hard Red Spring Wheat Quality Report

Physical, Chemical, Milling, and Baking Characteristics



1996 Crop

Spring & Durum Wheat Quality Lab
USDA/ARS
Harris Hall, NDSU
Fargo, ND 58105
701-231-7728

United States Department of Agriculture
Agriculture Research Service
RRVARC, Fargo, North Dakota

- not for publicaiton -

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURE RESEARCH SERVICE
in cooperation with
STATE AGRICULTURE EXPERIMENT STATIONS

QUALITY EVALUATION OF HARD RED SPRING WHEAT
CULTIVARS

1996 CROP^{1/}

by

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^{1/} This report represents cooperative investigations on the quality of Hard Red Spring Wheat cultivars from the 1996 crop. Some of the results presented have not been sufficiently confirmed to justify variety release. Confirmed results will be published through established channels. Cooperators submitting samples for analysis have been given analytical data on their samples prior to release of this report. This report is primarily a tool for use by cooperators and their official staff and to those individuals having direct and special interest in the development of agricultural research programs.

This report was compiled by the Agricultural Research Service, U. S. Department of Agriculture. Special acknowledgment is made to the North Dakota State University for use of their facilities and the services provided in support of these studies. The report is not intended for publication and should not be referenced in either literature citations or quoted in publicity and advertising. Use of the data may be granted for certain purposes upon written request to the agency or agencies involved.

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INTRODUCTION

Samples of standard cultivars and new selections of hard red spring wheat grown in cooperative experiments in the spring wheat regions of the United States are milled each year in the USDA/ARS Wheat Quality Laboratory. Wheat and their corresponding flours are evaluated for physical and chemical properties and the flours are baked to determine bread characteristics. The purpose of this report is to make available to the cooperators and other interested parties quality data on commercial cultivars and breeder's experimental lines of hard red spring wheat from the 1996 crop.

The evaluation of wheat involves the analysis of kernel characteristics, milling performance, and baking performance. Methods are described on pages 8-10.

SOURCE OF THE 1996 HARD RED SPRING WHEAT SAMPLES

The cooperative agencies and stations conducting the 1996 spring wheat nursery experiments are published in an annual report by R. H. Busch^{4/}. Tests were performed on 1002 samples that were received from the following 21 stations in six states (map, page 7). Data presented in this report represents the evaluation of spring wheat from Advanced, Special, Field Plot, and Uniform Regional Nurseries.

Minnesota Agricultural Experiment Station

Crookston, Morris, North, Rosemount, St. Paul, South

Montana Agricultural Experiment Station

Bozeman, Havre, Sidney

North Dakota Agricultural Experiment Station

Carrington, Dickinson, Langdon, Minot, Prosper, Williston

South Dakota Agricultural Experiment Station

Brookings, Day County, Groton, Selby

Washington Agricultural Experiment Station

Pullman

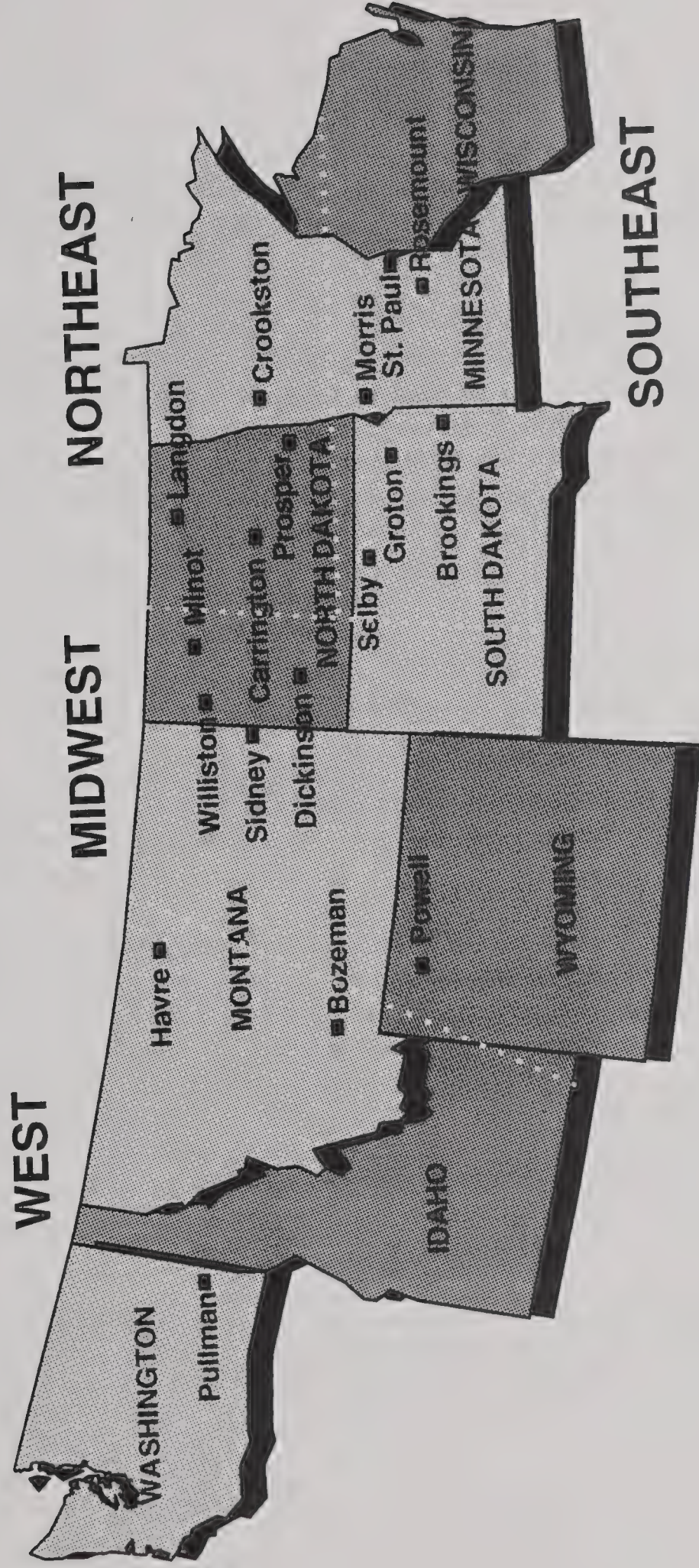
Wyoming Agricultural Experiment Station

Powell

^{4/} Busch, R. H. Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1996. Agricultural Research Service, U. S. Department of Agriculture and State Agricultural Experiment Station, St. Paul, MN.

Hard Red Spring Wheat Nurseries

1996 Crop Year



METHODS^{5/}

Test Weight Per Bushel - The weight per Winchester bushel of cleaned, dry wheat subsequent to passing the sample through a Carter-Day dockage tester.

1000-Kernel Weight - The weight of 1000 kernels was determined either by a Seedburo seed counter from the number of kernels in 10 g samples of cleaned, hand-picked wheat or by the Single Kernel Characterization System.

Kernel Size - The percentages of the size of kernels (large, medium and small) were determined using a wheat sizer as described by Shuey^{6/}.

The sieves of the sizer were clothed as follows:

Top Sieve - Tyler #7 with 2.92 mm opening
Middle Sieve - Tyler #9 with 2.24 mm opening
Bottom Sieve - Tyler #12 with 1.65 mm opening

Milling - The samples were cleaned by passing the wheat through a Carter-Day dockage tester. The clean samples were pretempered to 12.5% moisture for at least 72 hours, then tempered to 15.5% moisture ca. 16-20 hours before milling.

The Advanced, Special, and Uniform Regional Nursery samples were milled in Brabender Quadrumat Senior mill heads. The stock from the break was sifted for 60 sec on a strand sifter using #35 and #80 Tyler sieves. The throughs of the #80 sieve were classified as break flour; the overs of the #35 sieve were classified as bran; and the overs of the #80 sieve were passed through the reduction section. The reduction stock was sifted for 60 sec on a #80 Tyler sieve. The throughs were classified as reduction flour and the overs as shorts. The break and reduction flours were combined and classified as patent flour.

^{5/} Mention of a trademark name or a proprietary product does not constitute a guarantee or warranty of the product by the U. S. Department of Agriculture, and does not imply its approval to the exclusion of other products that may also be suitable.

^{6/} Shuey, William C. A Wheat Sizing Technique for Predicting Flour Milling Yield. Cereal Science Today 5:71-72,75 (1960).

The Field Plot Nursery samples were milled in a Buhler continuous experimental mill. The Buhler mill had been slightly modified for better comparison with commercial milling operations. Break scalping sieves were clothed with #54 stainless steel wire. Reduction scalping sieves were clothed with #58, #66 and #105 stainless steel wire for the first, second and third reductions, respectively. All flour sieves were clothed with #135 stainless steel wire.

The six flour streams from the Buhler mill were combined and classified as patent flour. The extraction of a good milling wheat using this flow is approximately 68% and is comparable to a commercial long patent flour. At a 68% flour extraction, changes in flour ash are most sensitive to changes in percent extraction.

Hardness Test - Wheat hardness scores were determined according to AACC Method 39-70A. The procedure involved grinding the wheat samples in a Udy grinder and obtaining reflectance data from a Technicon 450 near infrared analyzer. Wavelengths used were 1680 nm and 2230 nm. Hard red spring wheat kernels generally have NIR scores between 60 and 85.

Protein Content - Wheat and flour proteins were determined either by NIR reflectance or by the combustion method using the Leco Nitrogen Determinator. Nitrogen values were multiplied by 5.7 to calculate protein values, which were reported on a 14%mb.

Mineral or Ash Content - Wheat or flour ash was determined by measuring the residual weight of minerals remaining after incinerating the sample for approximately 16 hours at 575⁰C. The results were reported as percentages of the sample weights. Values were reported on a 14%mb.

Mixograph Analysis - Mixograph scores were determined from 30 g of flour (as is mb) and 20 cc of water. The sensitivity spring setting was set at 10. Water absorption was adjusted according to the peak height of the mixogram. Reference mixogram patterns (page 9) illustrate different dough characteristics. An arbitrary number is assigned each pattern to simplify the classification. The larger numbers indicate stronger gluten characteristics of the dough.

Baking Formula and Procedure

100% flour	3% Non-fat Dry Milk
2% salt	3% yeast
5% sugar	2% shortening (Crisco, melted) - 100 g loaves
	1% shortening (Crisco, melted) - 25 g loaves

Samples were mixed to optimum dough development in National Manufacturing mixers: the micro mixer for 25 g samples and the 100 g mixer for 100 g samples. Ascorbic Acid (40 ppm) for oxidation and Fungal Amylase (Doh-Tone)(15SKB units) for enzymatic supplement were added to each sample. Dough was moulded in a Roll-Er-Up moulder. Samples undergo 3 hour fermentation, 1 hour proof, and a 20 minute bake time at 220⁰ C.

Absorption - The amount of water, expressed as percent of flour, required for optimum dough consistency.

Dough Characteristics (DC) - Empirical scores ranging from 0-6 were used to classify dough as sticky-weak (0), pliable (2), elastic (3), or bucky (6). The most favorable rating for optimum bread characteristics would be elastic.

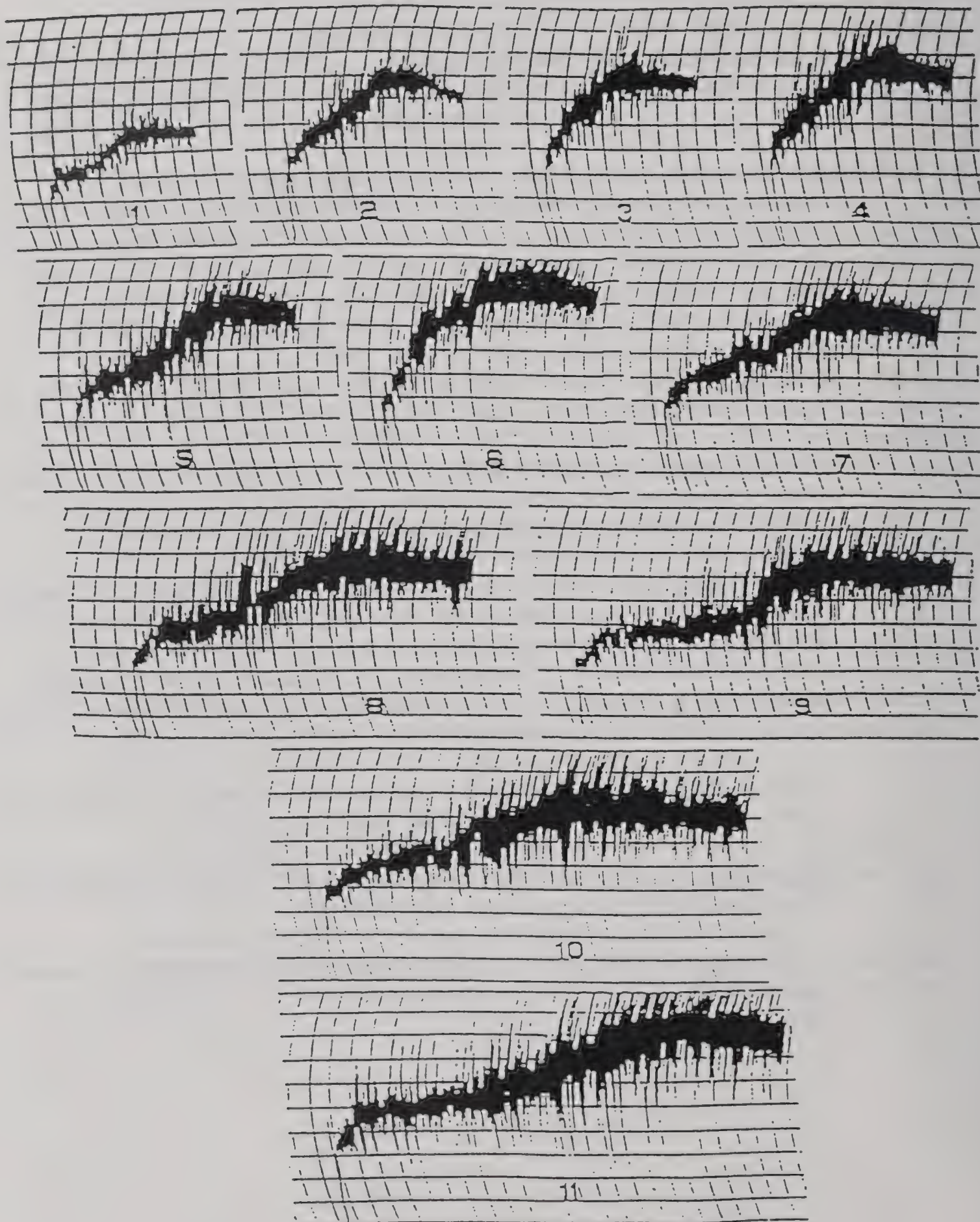
Crumb Color (CC) - A color value was determined by comparing the internal crumb color of the sample bread with the crumb color of a baking standard. The standard flour was an equal blend of the variety Grandin grown at Casselton and Minot, ND, Crookston, MN and Brookings, SD. Empirical scores ranging from 0-6 were used to classify crumb color as yellow (0), gray (2), dull (3), creamy (5), or bright white (6).

Crumb Grain (CG) - Empirical scores ranging from 0-6 were used to classify crumb grain as irregular, thick (0), open, thick (3), or fine (6).

Crumb Texture (CT) - Empirical scores ranging from 0-6 were used to classify crumb texture as harsh (0), coarse (3), or silky (6).

Loaf Volume - The volume (cc) of the baked loaf as determined by rapeseed displacement.
mixograph

STANDARD MIXOGRAPH PATTERNS



EXPERIMENTAL RESULTS - 1996 CROP

ADVANCED YIELD TRIALS - 380 samples from 10 stations, Table 1-16.

FIELD PLOTS - 26 samples from 3 stations, Table 17-19.

SPECIAL NURSERIES - 18 samples from 2 stations, Table 20-21.

UNIFORM REGIONAL NURSERY (URN) TRIALS

Spring wheat cultivars and experimental lines included in the URN trials are listed on page 13.

A total of 578 URN samples were received from 17 stations in 6 states. Twenty-seven selections were experimental lines and the remainder were commercial cultivars. Commercial cultivars included Butte 86 (used as the standard for comparison), Chris, Era, Marquis, and Stoa. Each sample was evaluated for kernel characteristics, milling performance, and breadmaking properties.

Tables 22-26 include data from the Northeast area; Tables 27-30 include data from the Southeast area; Tables 31-35 include data from the Midwest area; and Tables 36-38 include data from the Western area. Averages for each area are included in Tables 39-42.

1996 UNIFORM REGIONAL HARD RED SPRING WHEAT PERFORMANCE NURSERY

List of Entries

Entry No.	Entry	CI No. or Pedigree	Year Entered	Source
1.	Marquis	3651	1929	CAN
2.	Chris	13751	1969	MN
3.	Era	13986	1972	MN
4.	Stoa		1987	ND
5.	Butte 86		1987	ND
6.	SD8089	SD8056/SD8061//SD3051	1995	SD
7.	SD3219	SD3078/GRANDIN	1996	SD
8.	SD3236	SD3100/SD8061	1996	SD
9.	SD3249	SD3080/DALEN	1996	SD
10.	SD8108	SD8061/SD3118	1996	SD
11.	SBE0050	W8814/NORAK	1994	MN
12.	MN91309	SBI0037	1994	MN
13.	MN91227	MN87003/MN86497	1996	MN
14.	MN93413	NING8331/MN87029//MN89068	1996	MN
15.	MN93434	2375/GRANDIN	1996	MN
16.	SBF0402	ERIK/SBY0430A	1995	ND
17.	ND691	STOA*2/CARIFEN//AMIDON	1996	ND
18.	ND692	GRANDIN'S'/3/ND610/PEL 1373268// GRANDIN	1996	ND
19.	ND694	ND678/ND674	1996	ND
20.	ND695	IAS20*4/H567.71//STOA/3/ND674	1996	ND
21.	GUNNAR	RANDOM MATING	1995	AGRIP
22.	N92-0248	N87-0135/ND622	1995	AGRIP
23.	N92-0434	DALEN/HS85-0476	1995	AGRIP
24.	N92-0126	N86-0466/TELEMARK	1996	AGRIP
25.	N92-0176	N86-0111/N86-0099	1996	AGRIP
26.	MT9311	GLENMAN//OLAF/LEW	1996	MT
27.	MT9410	MT8808/MARBERG	1996	MT
28.	MT9433	MT8808/MARBERG	1996	MT
29.	T1105	JUNIN//RAPRE/CHEREN/3/FEICIANO	1996	TRI
30.	T801.93	CHILERO/BOM	1996	TRI
31.	SDM50005	VANCE/SUNSTARI	1996	SUN
32.	FA 994-601	SHARP/SUMAI #3	1996	WPB
33.	BW191	PENDING	1995	MANIT
34.	9023-FM04C	NORSEMAN/79150.X76B2/AC KARMA	1996	SASK

* Solid stem lines for sawfly resistance,

DISCUSSION

The following discussion presents the basic techniques and criteria used in the quality evaluation of the Hard Red Spring Wheat cultivars.

For the Uniform Regional Nursery samples, each quality variable (except for mix time) per wheat variety or experimental line was averaged within each hard red spring wheat region (Northeast, Southeast, Midwest, and West). Values that are bolded/underlined indicate that averages are higher than the standard wheat variety, Butte 86. For wheat and flour ash, bolded/underlined values are lower than the standard.

All samples were compared with a milling and baking standard representative of the crop year. Environmental conditions within a growing location can affect the agronomic factors of the wheat, and subsequently the milling and baking factors. A wheat cultivar may be low in protein content because of the environmental growing conditions, but may contain large plump kernels with good milling characteristics. Wheat from this area may exhibit weak gluten characteristics that are inconsistent with the same cultivar grown at other spring wheat locations. Preferably, a commercial cultivar of wheat should have tolerance (protein stability) to a wide range of environmental conditions.

Kernel Characteristics are important for determining the initial value of wheat. Poor kernel characteristics could disqualify an experimental line from further consideration. High test weight is an indicator of grain soundness. Plump kernels are desirable because of the high ratio of endosperm to bran. Low 1000-kernel weight and small kernel size distribution affect milling performance and flour yield. High wheat ash impacts the ash content of the flour. Wheat protein quality and quantity are important characteristics when comparing cultivars that are grown at the same location. Low protein wheat impacts bread baking performance.

Milling Performance is an important characteristic of spring wheat. Low extraction and high flour ash are major factors that are unacceptable in commercial milling operations. As a general rule, an increase of 0.01% in ash content is equivalent to an increase of approximately 2% in flour extraction.

Milling characteristics: Different milling techniques are required for hard and soft wheat. Each type requires different roll pressure, clothing, sifter surface, and tempering to be milled properly. Blending wheat with different hardness characteristics is undesirable and impacts the milling operation. Adjustments would either have to be made in the mill flow or in the tempering procedure to compensate for differences in kernel hardness. During the milling operation, the amount of flour protein recovered from wheat is important. High protein wheat yielding low protein flour is undesirable.

Mixogram patterns are important for estimating the strength and potential mixing tolerance of a flour. From the reference mixogram patterns (page 11), patterns 4 - 8 indicate flours with optimum mixing tolerance and gluten strength. Mixogram patterns 9 - 11 indicate flour samples with long mixing times, and strong gluten characteristics, whereas, patterns 1 - 3 indicate flours with weak gluten characteristics and short mixing times. Both the pattern and length of the curve should be considered in the evaluation. Abnormal curves, such as sway-back or long initial times to incorporate water, indicate undesirable characteristics.

Baking evaluation takes into account the flour water absorption, mixing time, dough characteristics, loaf volume, crumb texture, and machinability. Flour with a low water absorption is undesirable. Flour with a short mix time is undesirable and has weak gluten characteristics.

The crumb grain or appearance of the interior of the loaf indicates the structural integrity during baking. Crumb grain is likely related to gluten protein properties (quantity and quality).

Bread loaf volume indicates the potential strength of a dough. Optimum loaf volume demonstrates the capacity, or lack thereof, for the dough to expand under pressure and to contain the entrapped gases during expansion. A weak dough tends to collapse and yields bread with a low loaf volume or yields bread with a large volume containing large holes in the interior. A low protein flour produces a dough with undesirable elasticity and extensibility to expand adequately during fermentation or baking and thus yields a bread with low loaf volume. A tough or bucky dough is bound too tightly for adequate expansion of the gases, which results in a bread with low loaf volume. Loaf volume is a characteristic that is likely related to gluten functionality in the dough.

1996 Spring Wheat Quality Report

LOCATION: Crookston, MN
NURSERY: AY-1

USDA / ARS
WHEAT QUALITY LAB
FARGO, ND

Table 1

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating				LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)						C	C	G	T	
2375	63.3	41.0	90	0	75	13.9	1.53	60.1	12.6	0.31	59.0	3	59.0	3.00	3	3	4	4	4	183
VERDE	62.4	35.5	88	0	83	11.9	1.65	64.2	10.5	0.33	56.5	3	60.5	5.00	3	4	3	6	6	182
GRANDIN	62.7	37.3	88	1	91	13.5	1.62	60.1	12.0	0.36	57.6	3	61.5	4.50	3	4	2	5	5	205
MF9604	60.6	37.9	83	1	60	14.1	1.64	50.5	12.4	0.37	57.3	3	59.0	5.00	3	4	5	6	6	190
MF9605	61.1	38.0	86	1	57	14.0	1.52	55.3	12.3	0.35	57.9	3	60.0	4.75	3	4	3	6	6	198
MF9606	63.5	36.8	87	0	74	14.7	1.60	59.8	13.6	0.31	61.4	3	61.5	3.00	3	4	5	5	5	193
MF9607	60.4	35.8	74	2	81	12.5	1.78	59.0	11.0	0.44	55.8	2	62.0	4.25	3	3	5	5	5	190
MF9608	60.1	44.1	94	0	18	12.9	1.79	46.4	11.3	0.39	57.3	3	61.0	4.00	3	4	3	4	4	184
BACAP	63.8	32.9	56	1	84	16.6	1.82	54.8	15.3	0.34	63.7	5	63.5	3.00	3	4	2	4	4	208
ACBARRIE	61.6	34.2	78	1	71	14.7	1.66	64.7	12.9	0.36	63.1	4	63.0	3.50	3	4	3	5	5	208
FA994-601	64.3	37.0	87	1	69	13.2	1.59	62.2	11.8	0.37	58.2	3	62.5	3.25	3	4	3	6	6	191
2375	59.4	31.7	66	2	69	13.5	1.76	61.9	12.2	0.42	57.3	3	61.0	4.25	3	3	3	1	1	188

RATINGS:	0						3			6		
	DOUGH CHAR (DC):			STICKY-WEAK			PLIABLE			ELASTIC		
	CRUMB COLOR (CC):			YELLOW			GREY			DULL		
	CRUMB GRAIN (CG):			IRREG, THICK			OPEN, THICK			COARSE		
	CRUMB TEXTURE (CT):			HARSH			CREAMY			BRIGHT WHITE		
										FINE		
										SILKY		

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USDA / ARS WHEAT QUALITY LAB

Table 2

LOCATION: *North, MN*
NURSERY: *AY-1*

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR PRO ASH (14 % mb)		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating			LOAF VOL (cc)
						PRO	ASH (14% mb)		PRO	ASH (14 % mb)						C	C	C	
CHRIS	58.6	26.8	56	4	78	14.7	1.58	59.5	14.2	0.44	59.6	3	59.5	2.75	3	4	3	6	218
MARSHALL	58.8	26.1	41	8	62	13.2	1.90	67.1	12.4	0.46	59.3	2	59.0	2.75	3	4	3	6	192
WHEATON	51.0	24.8	33	12	57	13.5	1.91	55.3	12.9	0.57	59.3	2	59.0	3.75	3	4	3	5	228
NORM	54.9	27.6	55	6	63	13.0	1.73	56.4	12.3	0.55	57.6	2	57.5	3.75	3	4	6	5	210
VERDE	59.2	29.1	65	3	75	12.9	1.52	64.1	11.8	0.44	59.6	2	56.8	3.25	3	3	6	4	200
BUTTE86	60.3	33.5	79	1	82	14.9	1.71	62.4	13.6	0.44	59.3	2	61.0	2.75	3	4	3	6	205
BACUP	62.0	28.8	78	4	61	17.2	1.77	57.4	16.3	0.42	62.5	4	62.5	2.50	3	4	5	6	240
STOA	58.7	28.8	57	4	68	14.6	1.79	62.2	13.8	0.42	60.8	3	60.8	3.50	3	4	5	5	195
GRANDIN	61.0	32.0	77	2	72	14.9	1.72	64.2	14.3	0.40	61.4	4	63.5	3.75	3	4	5	6	241
KULM	60.4	29.7	61	4	70	15.4	1.83	61.0	14.8	0.38	63.4	4	60.8	3.00	3	3	3	6	232
TREATON	60.1	33.5	73	2	81	15.0	1.73	58.7	14.5	0.38	60.8	4	62.8	3.50	3	4	3	6	230
SHARP	61.6	31.4	72	2	65	14.6	1.67	59.2	13.9	0.33	60.0	2	60.0	3.00	3	5	2	6	208
RUSS	60.3	32.3	76	1	81	14.5	1.67	58.1	13.2	0.42	59.0	3	61.0	4.00	3	4	4	4	210
GUNNAR	61.3	28.7	59	3	80	15.4	1.81	61.5	14.6	0.48	61.1	3	63.0	3.25	3	3	3	5	218
NORDIC	58.5	29.8	64	4	61	12.5	1.65	59.1	11.7	0.48	58.6	2	60.8	3.25	3	4	6	5	212
HAMER	59.7	33.3	79	2	74	14.0	1.74	63.3	13.3	0.48	59.6	3	59.5	3.50	3	4	4	5	210
LARS	58.8	29.5	72	2	78	13.2	1.67	59.6	12.0	0.50	55.0	2	55.0	4.00	3	4	3	5	202
NORLANDER	58.6	26.2	44	7	82	14.7	1.65	57.1	13.7	0.43	60.5	4	60.5	4.00	3	4	3	6	222
2375	59.7	33.1	64	3	77	14.5	1.66	57.4	13.3	0.46	58.2	2	58.5	3.00	3	3	2	6	198
2370	59.5	28.4	46	7	68	14.3	1.69	56.7	13.7	0.47	61.8	3	62.0	3.25	3	4	4	6	218

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USDA / ARS WHEAT QUALITY LAB

Table 2 (cont.)

LOCATION: North, MN
NURSERY: AY-1

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	Rating					LOAF VOL (cc)
						PRO	ASH (14% mb)	EXT	PRO	ASH (14% mb)				D	C	C	C	T	
OXEN	59.6	29.1	61	4	76	14.2	1.66	63.1	13.1	0.37	61.4	4	63.5	3	4	5	6	6	232
SD3156	62.8	33.3	76	3	70	13.5	1.66	54.7	12.4	0.35	58.2	2	58.5	3	4	3	5	5	198
AC MAJESTIC	59.1	29.1	58	3	83	15.0	1.70	62.1	14.6	0.45	60.5	3	61.5	3	3	2	6	6	231
AC DOMAIN	59.9	30.5	71	1	79	15.2	1.81	60.7	14.1	0.47	59.6	2	59.5	3	3	5	6	6	195
AC CORA	59.5	30.2	70	2	91	15.3	1.76	57.1	14.3	0.47	55.3	1	57.0	3	3	5	5	5	202
SBE0050	59.0	29.8	43	6	61	13.4	1.63	57.7	12.9	0.44	58.2	3	60.5	3	4	5	6	6	211
MN91309	59.4	32.2	53	4	71	14.3	1.65	62.2	13.9	0.38	57.9	3	60.0	3	4	3	5	5	228
MN91227	58.5	29.7	57	5	50	13.3	1.78	54.1	12.6	0.47	51.9	1	56.0	3	4	3	4	4	190
MN93049	58.2	30.5	57	5	70	14.9	1.85	56.7	14.2	0.49	60.8	3	58.8	3	4	4	5	5	218
MN93413	57.7	31.3	55	6	80	12.5	1.63	60.4	11.2	0.46	54.6	2	54.8	3	4	3	5	5	193
MN93434	61.4	32.6	75	2	76	13.9	1.62	61.9	12.7	0.43	55.8	3	58.0	3	3	3	5	5	203
MN93471	60.6	30.4	60	4	64	14.3	1.59	54.6	13.3	0.44	57.9	2	58.0	3	4	3	5	5	218
MN2540	59.9	23.9	24	10	63	13.3	1.68	60.9	12.7	0.40	60.0	2	62.0	3	3	3	5	5	188

RATINGS:		0			3			6			
		DOUGH CHAR (DC):		STICKY-WEAK		PLIABLE		ELASTIC		BUCKY	
		CRUMB COLOR (CC):		YELLOW		GREY		DULL		CREAMY	
		CRUMB GRAIN (CG):		IRREG, THICK		HARSH		OPEN, THICK		BRIGHT WHITE	
CRUMB TEXTURE (CT):										FINE	
										SILKY	

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USDA / ARS
WHEAT QUALITY LAB

Table 3

LOCATION: Rosemount, MN
NURSERY: AY-1

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR EXT (%)	FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	Rating				LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	PRO		ASH (14 % mb)	C						C	C	G	T	
VERDE	53.0	23.3	37	8	60	11.8	1.76	59.3	10.8	0.35	55.5	2	57.5	5.00	3	4	3	1	180		
GRANDIN	58.7	32.3	75	2	61	13.5	1.72	58.7	12.0	0.40	55.5	2	59.5	5.50	3	4	5	4	191		
MF9604	56.1	31.8	59	4	68	15.1	1.77	56.8	13.4	0.41	59.6	4	63.5	4.75	3	3	3	1	191		
MF9605	63.8	32.7	75	2	60	13.4	1.62	55.5	11.8	0.38	58.2	3	62.5	5.00	3	4	3	1	190		
MF9606	57.0	27.4	47	4	67	14.6	1.79	58.8	12.9	0.36	61.4	4	59.5	3.75	3	3	5	1	194		
MF9607	56.6	29.8	51	3	71	14.5	1.80	55.0	12.7	0.40	59.3	3	63.0	3.50	3	4	5	5	202		
MF9608	53.4	33.0	70	2	18	15.4	2.01	33.9	13.4	0.33	58.6	4	60.8	4.25	3	4	3	5	200		
BACUP	62.2	28.7	36	5	68	16.6	1.86	54.8	15.2	0.36	62.5	4	64.5	3.25	3	4	4	5	205		
ACBARRIE	56.8	28.7	37	7	61	14.0	1.78	59.5	12.8	0.41	55.5	2	57.5	4.75	3	4	3	5	198		
FA994-601	61.6	32.3	73	3	62	13.8	1.64	63.4	12.6	0.35	59.0	2	61.0	3.50	3	4	5	5	188		

RATINGS:	0						3		6	
	DOUGH CHAR (DC):	STICKY-WEAK	PLIABLE	ELASTIC	BUCKY					
	CRUMB COLOR (CC):	YELLOW	GREY	DULL	CREAMY	BRIGHT WHITE				
	CRUMB GRAIN (CG):	IRREG, THICK		OPEN, THICK		FINE				
	CRUMB TEXTURE (CT):	HARSH		COARSE		SILKY				

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USDA / ARS WHEAT QUALITY LAB

Table 4

LOCATION: *South, MN*
NURSERY: AY-1

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR EXT (%)	FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	Rating				LOAF VOL (cc)
					HARD- NESS	C	PRO	ASH (14% mb)		PRO	ASH (14% mb)						C	C	G	T	
CHRIS	60.2	29.9	75	2	84	15.9	1.76	57.7	14.8	0.41	59.3	2	61.0	2.75	3	5	5	5	5	218	
MARSHALL	60.0	28.2	58	3	63	13.5	1.79	66.7	12.3	0.44	57.9	2	60.0	3.25	3	4	5	4	5	200	
WHEATON	59.7	32.1	73	2	63	13.7	1.82	61.0	12.4	0.45	57.3	2	59.0	4.50	3	4	3	4	3	205	
NORM	60.6	35.8	80	1	77	14.1	1.65	57.7	12.6	0.42	56.5	2	58.5	4.00	3	5	3	5	3	210	
VERDE	60.0	31.8	78	1	75	14.0	1.72	65.4	12.8	0.38	59.0	1	61.0	3.00	3	4	5	5	5	208	
BUTTE86	60.6	35.2	88	1	79	15.4	1.80	61.1	14.3	0.37	60.8	2	58.8	2.75	3	3	3	3	4	202	
BACUP	62.3	30.7	44	3	74	17.3	1.97	50.2	16.6	0.38	62.1	2	64.0	2.50	3	4	5	5	5	222	
STOA	58.6	28.5	54	3	74	14.5	1.70	57.1	13.7	0.37	59.6	3	59.5	4.00	3	4	4	4	5	210	
GRANDIN	61.2	33.7	82	2	76	15.1	1.72	59.5	14.0	0.40	58.6	4	60.8	4.25	3	5	2	5	5	209	
KULM	61.8	30.9	73	2	75	15.5	1.72	61.3	14.7	0.37	61.4	3	63.5	3.50	3	4	5	5	5	248	
TREATON	60.9	33.8	83	1	79	15.0	1.69	54.8	13.6	0.40	61.4	4	61.5	4.25	3	3	5	5	5	220	
SHARP	61.8	34.3	85	0	77	15.4	1.73	55.0	14.2	0.34	60.0	2	60.0	3.00	3	3	5	5	6	210	
RUSS	60.6	33.5	81	1	81	14.8	1.73	54.6	12.9	0.41	60.5	4	62.5	3.75	3	4	5	5	6	202	
GUNNAR	60.9	28.4	64	2	81	15.7	1.90	55.7	14.4	0.41	61.1	2	61.0	3.50	3	4	3	5	5	224	
NORDIC	60.3	36.1	76	1	73	12.7	1.60	58.9	11.4	0.35	57.6	3	59.5	3.75	3	0	5	5	5	191	
HAMER	60.7	34.6	87	1	78	15.0	1.75	60.7	13.8	0.36	61.1	4	63.0	3.50	3	0	3	6	6	212	
LARS	59.1	33.9	80	1	75	14.2	1.73	57.7	12.6	0.37	56.9	3	58.8	4.50	3	4	3	6	6	200	
NORLANDER	59.9	29.2	62	2	86	14.7	1.67	53.9	13.1	0.36	58.2	2	60.5	3.50	3	4	3	6	6	204	
2375	61.2	36.0	81	1	84	15.2	1.76	52.3	13.2	0.39	58.6	2	60.8	3.75	3	5	3	4	4	191	
2370	61.0	32.7	89	2	88	15.1	1.68	51.8	13.5	0.42	57.9	3	58.0	4.25	3	3	3	5	5	214	

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USDA / ARS WHEAT QUALITY LAB

Table 4 (cont.)

LOCATION: *South, MN*
NURSERY: *AY-1*

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR EXT (%)	FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	Rating				LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	PRO		ASH (14 % mb)	C						C	C	G		
																				C	
OXEN	60.4	29.9	66	2	77	14.5	1.77	61.9	12.9	0.29	59.0	4	61.0	4.50	3	5	2	4	200		
SD3156	60.9	30.6	69	2	72	15.1	1.71	59.0	14.0	0.33	58.6	3	60.8	3.50	3	0	2	5	202		
AC MAJESTIC	58.9	32.3	72	2	77	15.9	1.81	57.1	15.0	0.34	61.4	3	63.5	3.25	3	0	2	6	220		
AC DOMAIN	59.5	31.2	76	1	88	16.3	1.83	55.3	14.9	0.36	60.0	2	62.0	2.75	3	3	5	5	189		
AC CORA	59.6	29.8	74	1	85	16.1	1.80	52.1	14.6	0.37	55.3	1	57.0	3.00	3	3	3	5	204		
SBE0050	59.7	31.8	56	4	69	13.9	1.63	52.8	12.8	0.36	56.5	2	60.5	4.75	3	3	3	5	198		
MN91309	60.2	34.3	65	2	79	14.5	1.64	58.3	13.0	0.43	59.6	3	61.5	4.00	3	3	3	6	198		
MN91227	60.5	32.3	71	2	58	13.8	1.80	57.5	12.9	0.44	53.2	1	61.0	3.00	3	3	3	6	194		
MN93049	60.1	34.9	80	1	73	14.9	1.79	60.8	14.0	0.40	58.6	3	62.8	3.25	3	0	5	6	212		
MN93413	60.1	31.9	55	3	69	13.1	1.64	58.7	11.6	0.45	57.3	3	59.0	3.75	3	3	3	5	191		
MN93434	61.3	35.1	57	2	91	15.3	1.72	54.6	13.4	0.41	59.0	4	61.0	4.00	3	5	3	4	192		
MN93471	62.3	32.2	75	2	79	15.3	1.71	51.4	13.7	0.38	57.3	2	59.0	3.25	3	3	3	5	200		
MN2540	60.7	27.9	50	5	76	14.6	1.76	58.3	13.4	0.35	59.6	2	59.5	2.50	3	3	3	4	202		

RATINGS:		0						3		6	
		STICKY-WEAK		PLIABLE		ELASTIC		CREAMY		BUCKY	
		YELLOW		GREY		DULL		OPEN, THICK		BRIGHT WHITE	
		IRREG, THICK		HARSH		COARSE		FINE		SILKY	

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USDA / ARS
WHEAT QUALITY LAB

Table 5

LOCATION: Crookston, MN
NURSERY: AY-2

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	-----Rating-----					LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	C	C						G	T				
CHRIS	56.5	23.9	46	7	74	15.4	1.76	57.3	14.7	0.46	59.3	2	61.0	3.25	3	3	5	6	6	216			
2375	62.1	37.7	78	1	85	14.5	1.93	59.6	13.6	0.42	59.3	2	61.0	2.75	3	3	5	6	6	202			
VERDE	58.2	29.2	66	4	81	13.4	1.80	59.1	12.1	0.42	60.5	3	61.5	3.75	3	3	6	4	4	203			
NORM	60.3	31.7	51	4	65	15.1	1.76	47.2	14.6	0.45	64.7	4	64.8	3.00	3	3	3	6	6	214			
MN93044	59.2	26.4	42	10	78	16.1	2.00	61.2	15.2	0.47	63.7	4	63.5	3.25	3	4	2	5	5	212			
MN93200	60.7	34.0	79	2	73	14.1	1.94	58.2	12.9	0.51	56.2	1	58.5	2.75	1	3	6	4	4	184			
MN93233	58.2	26.4	43	7	74	14.1	1.97	58.3	13.3	0.46	59.0	3	61.0	3.50	3	5	5	5	5	188			
MN93262	61.8	38.5	82	1	75	14.8	1.71	55.9	14.2	0.36	63.4	3	61.5	2.50	3	3	3	6	6	218			
MN93346	57.2	28.0	46	6	55	14.8	1.79	53.9	13.9	0.43	60.8	3	60.8	3.25	3	4	3	6	6	200			
MN93357	59.4	30.8	72	2	77	14.7	1.97	57.3	14.0	0.42	63.1	3	59.0	3.25	3	5	4	6	6	224			
MN93377	60.3	31.9	70	3	75	13.9	1.79	56.7	12.7	0.44	60.8	4	62.8	3.75	3	5	5	5	5	202			
MN93385	60.6	36.1	79	1	92	14.7	1.80	58.7	13.6	0.43	61.4	2	61.5	2.25	2	4	5	5	5	184			
MN2533	58.7	27.0	57	7	79	15.1	1.76	54.6	14.5	0.40	63.1	3	63.0	3.25	3	3	3	5	5	222			
MN94017	58.9	27.7	53	5	72	14.6	1.72	54.6	13.3	0.41	58.6	2	56.8	2.75	3	3	3	5	5	212			
MN94053	60.9	29.5	53	4	75	14.7	1.73	52.5	14.0	0.34	61.8	4	62.0	3.25	3	4	3	6	6	210			
MN94055	61.5	34.7	77	2	57	13.9	1.80	48.8	13.5	0.35	58.2	1	60.5	2.50	2	4	5	6	6	191			
MN94095	59.4	38.9	67	4	73	14.4	1.70	60.8	13.6	0.42	59.3	2	59.0	2.50	2	4	5	5	5	180			
MN94111	61.3	34.2	70	3	67	12.6	1.80	54.4	11.3	0.44	58.2	1	58.5	1.75	1	0	3	4	4	165			
MN94123	61.0	29.8	54	6	96	13.8	1.71	62.1	12.2	0.43	58.2	2	60.5	3.00	2	4	3	5	5	180			
MN94128	59.1	27.6	57	5	62	14.9	1.75	54.6	13.7	0.44	60.8	3	60.8	3.50	3	3	3	5	5	204			

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LOCATION: Crookston, MN
NURSERY: AY-2

USDA / ARS WHEAT QUALITY LAB FARGO, ND

Table 5 (cont.)

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D		C		LOAF VOL (cc)
						PRO	ASH (14% mb)	EXT	PRO	ASH (14% mb)				C	C	C	G	
MN94151	60.6	29.8	67	4	70	14.7	1.82	54.6	13.8	0.42	60.8	1	2.25	1	0	3	6	174
MN94155	62.5	33.9	80	1	99	14.6	1.75	60.3	13.8	0.43	60.5	1	2.00	1	4	3	3	162
MN94173	58.7	29.9	56	5	97	15.0	1.68	57.1	13.3	0.43	60.8	3	3.25	3	5	4	4	192
MN94182	59.1	29.8	56	2	65	14.4	1.78	58.3	13.8	0.42	61.1	3	2.50	3	3	3	6	198
MN94200	61.0	29.7	57	5	74	15.1	1.82	56.6	14.2	0.39	61.4	3	3.00	3	6	3	6	214
MN94234	62.0	29.3	49	4	78	13.9	1.80	58.5	13.2	0.33	60.5	3	2.75	3	6	6	6	178
MN94299	55.6	29.1	55	9	67	15.0	1.82	51.6	14.0	0.43	59.3	1	2.50	1	0	3	5	194
MN94346	61.6	33.6	81	1	78	17.1	1.98	54.6	16.0	0.40	57.6	2	2.25	2	6	5	6	204
MN94347	61.4	32.8	78	2	98	16.2	1.87	56.6	14.9	0.40	57.6	1	2.50	1	3	4	6	192
MN94350	62.2	31.9	67	2	90	17.1	1.84	57.7	16.7	0.50	57.9	1	2.00	1	6	3	5	190

RATINGS:	0						3		6	
	DOUGH CHAR (DC):			STICKY-WEAK			ELASTIC		BUCKY	
	CRUMB COLOR (CC):			YELLOW			DULL		BRIGHT WHITE	
	CRUMB GRAIN (CG):			IRREG, THICK			OPEN, THICK		FINE	
	CRUMB TEXTURE (CT):			HARSH			COARSE		SILKY	

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USDA / ARS
WHEAT QUALITY LAB

Table 6

LOCATION: St. Paul, MN
NURSERY: AY-2

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	Rating-----						LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	FLOUR (14 % mb)		D C	C G					C T	C VOL					
									PRO	ASH													
CHRIS	59.7	28.6	76	2	89	16.3	1.83	61.9	15.1	0.42	60.5	3	62.5	3.00	3	3	3	5	221				
2375	60.9	34.7	72	2	87	15.6	1.89	62.0	13.8	0.40	56.5	2	60.5	3.25	3	5	3	4	195				
VERDE	61.1	30.9	72	2	80	14.7	1.82	66.4	12.9	0.38	56.9	2	56.8	3.75	3	4	3	4	205				
NORM	60.4	36.3	81	2	82	15.0	1.89	61.6	13.6	0.39	60.8	4	62.8	4.00	3	3	3	4	214				
MN93044	60.6	30.3	61	3	73	15.6	1.83	59.3	13.7	0.42	57.3	3	59.0	4.50	3	0	5	5	212				
MN93200	60.9	34.1	79	2	66	14.1	1.98	61.2	12.1	0.46	52.9	1	55.5	3.50	3	5	5	4	191				
MN93233	60.5	28.8	51	5	73	14.2	1.98	59.8	12.7	0.35	56.2	2	56.5	4.00	3	0	5	4	210				
MN93262	60.6	34.5	75	2	86	14.4	1.60	60.5	13.0	0.38	59.0	2	59.0	3.25	3	4	5	4	200				
MN93346	60.9	35.2	78	0	69	15.7	1.89	58.2	14.3	0.40	56.2	2	58.5	3.25	3	3	3	6	214				
MN93357	61.8	34.9	85	1	84	14.9	1.82	59.1	13.4	0.36	62.5	2	58.5	3.00	3	0	3	5	212				
MN93377	61.4	33.2	73	1	89	14.4	1.81	54.5	12.2	0.37	56.5	3	58.5	4.00	3	5	3	5	192				
MN93385	61.5	37.8	84	1	88	15.2	1.84	58.0	14.1	0.40	63.1	3	61.0	2.50	3	3	5	5	194				
MN2533	61.1	30.4	52	2	85	18.0	1.95	52.8	17.2	0.38	66.8	3	62.8	2.25	3	4	3	5	210				
MN94017	60.9	30.6	67	3	75	13.6	1.67	60.8	12.3	0.41	53.5	1	55.5	3.00	3	4	2	4	180				
MN94053	63.4	34.4	73	1	82	14.8	1.86	57.3	12.9	0.39	60.0	2	62.0	3.00	3	4	3	5	200				
MN94055	60.9	34.9	76	1	63	14.0	1.97	49.3	12.3	0.42	55.0	1	57.0	2.50	2	4	3	4	175				
MN94095	60.1	36.5	77	1	86	14.8	1.66	60.7	12.9	0.40	57.6	2	57.5	2.75	3	0	6	4	185				
MN94111	60.4	34.4	67	1	71	14.3	1.80	55.5	13.0	0.43	54.3	1	58.5	2.00	2	0	6	4	164				
MN94123	61.3	32.3	70	1	93	14.0	1.87	60.0	12.1	0.44	58.2	2	58.5	3.00	3	4	5	6	188				
MN94128	60.7	30.8	75	1	67	14.3	1.75	56.4	12.7	0.34	59.0	3	61.0	4.00	3	4	5	6	202				

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USDA / ARS
WHEAT QUALITY LAB
FARGO, ND

Table 6 (cont.)

LOCATION: St. Paul, MN
NURSERY: AY-2

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT PRO (14% mb)	ASH (14% mb)	FLOUR EXT (%)	FLOUR PRO (14% mb)	ASH (14% mb)	MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	C C	C G	C T	LOAF VOL (cc)
MN94151	59.1	30.4	67	3	65	14.5	1.79	56.4	12.7	0.39	56.9	1	58.8	2.75	3	0	6	5	184
MN94155	61.9	35.3	81	2	92	15.6	1.78	59.4	14.0	0.42	57.3	1	59.0	2.00	2	3	4	4	162
MN94173	61.8	31.1	54	5	63	14.5	1.92	61.0	13.1	0.39	59.3	4	60.8	4.50	3	3	3	4	198
MN94182	60.5	33.0	78	2	87	14.8	1.71	61.8	13.5	0.35	57.6	2	59.5	3.25	3	4	3	5	197
MN94200	60.5	31.1	68	2	95	14.0	1.81	60.6	12.6	0.42	58.6	2	60.8	3.50	3	3	3	5	200
MN94234	58.5	28.2	44	3	76	15.4	1.89	53.2	13.5	0.34	61.1	3	61.0	2.75	3	3	3	5	181
MN94299	59.8	36.0	75	2	83	14.4	1.79	53.4	12.9	0.43	53.2	1	55.0	2.50	1	4	4	4	180
MN94346	59.9	28.6	45	2	91	16.5	1.90	53.7	15.5	0.60	53.5	1	55.5	2.25	1	4	3	1	154
MN94347	59.0	30.4	43	3	94	16.7	1.88	56.7	15.6	0.57	53.5	1	57.5	2.50	1	4	3	1	150
MN94350	58.7	27.6	30	3	90	17.1	1.90	54.1	16.4	0.57	53.3	1	57.5	2.25	1	4	3	1	140

RATINGS:	0			3			6		
	DOUGH CHAR (DC):	STICKY-WEAK	PLIABLE	ELASTIC		BUCKY			
	CRUMB COLOR (CC):	YELLOW	GREY	DULL	CREAMY	BRIGHT WHITE			
	CRUMB GRAIN (CG):	IRREG, THICK		OPEN, THICK		FINE			
	CRUMB TEXTURE (CT):	HARSH		COARSE		SILKY			

1996 Spring Wheat Quality Report

LOCATION: Crookston,MN
NURSERY: AY-3

USDA / ARS
WHEAT QUALITY LAB
FARGO, ND

Table 7

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----						LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	FLOUR (14 % mb)							C	C	C	G	T		
									ASH (14% mb)	ASH (14 % mb)												
CHRIS	56.1	23.3	46	7	82	15.1	1.80	58.0	14.6	0.40	63.7	4	62.5	2.50	3	3	3	6	6	224		
2375	62.1	37.9	80	1	74	13.1	1.58	61.8	11.9	0.39	59.6	2	61.5	2.75	3	3	3	5	6	193		
VERDE	59.0	29.8	67	4	77	12.6	1.68	63.1	11.3	0.41	59.3	2	61.0	3.75	3	3	3	3	5	198		
NORM	55.4	28.6	58	5	66	13.6	1.90	50.2	12.4	0.52	59.6	2	61.5	3.75	3	4	5	5	5	209		
MN95002	63.0	33.3	70	3	63	15.0	1.72	59.7	14.3	0.36	58.6	2	60.8	2.75	3	3	2	5	5	218		
MN95013	55.6	26.4	62	8	66	15.1	1.80	57.8	14.7	0.38	62.7	3	62.8	2.75	3	4	3	5	5	210		
MN95023	63.0	28.7	61	5	73	14.4	1.75	56.4	13.5	0.40	60.8	3	62.8	3.00	3	3	3	6	6	228		
MN95051	62.3	31.8	70	2	85	14.4	1.65	64.5	13.9	0.39	61.1	3	63.0	3.50	3	3	5	6	6	238		
MN95053	58.9	30.0	61	3	77	13.1	1.82	58.3	12.0	0.41	63.4	4	65.5	3.50	3	3	3	6	6	225		
MN95058	58.7	29.2	70	2	83	13.9	1.84	56.2	13.0	0.41	58.6	3	62.8	5.00	3	5	3	5	5	220		
MN95065	56.5	30.8	61	5	53	14.6	1.91	55.1	14.1	0.44	61.1	3	63.0	3.50	3	4	5	4	4	210		
MN95072	56.8	27.0	49	8	68	14.3	1.71	59.6	13.6	0.41	61.1	4	61.0	3.50	3	4	3	5	5	221		
MN95081	58.7	25.0	32	12	82	13.3	1.72	58.3	11.6	0.48	57.3	2	61.0	3.50	3	3	3	5	5	204		
MN95084	61.1	32.3	70	4	80	13.4	1.70	59.7	12.5	0.41	53.8	2	61.5	5.25	3	3	2	5	5	198		
MN95088	56.3	28.2	46	10	65	14.1	1.86	53.2	12.2	0.46	59.0	2	61.0	3.00	2	0	5	5	5	195		
MN95090	58.7	29.2	68	4	62	13.6	1.83	49.5	12.4	0.46	54.3	2	62.5	4.75	3	4	3	5	5	190		
MN95091	58.0	27.1	62	6	75	13.7	1.97	54.4	12.0	0.47	57.6	2	61.5	3.00	2	0	3	5	5	194		
MN95092	57.8	27.2	54	4	54	13.9	1.89	46.3	12.9	0.45	58.6	3	60.8	3.75	2	0	4	5	5	219		
MN95102	58.9	28.2	64	4	79	15.4	1.79	59.1	13.2	0.44	65.4	3	61.5	2.25	3	3	5	5	5	182		
MN95118	56.8	27.2	56	6	66	14.5	1.70	55.5	13.7	0.42	59.6	3	59.5	3.50	3	0	5	6	6	198		
MN95122	61.1	36.8	85	2	79	13.4	1.70	59.5	11.5	0.46	56.2	2	60.5	3.50	2	4	5	4	4	180		
MN95124	61.8	29.2	55	4	21	13.7	1.80	32.4	11.3	0.40	57.6	2	59.5	2.75	2	4	5	5	5	182		
MN95126	62.5	30.5	65	2	28	12.1	1.72	38.1	9.4	0.36	51.9	1	54.0	2.75	1	2	3	4	4	152		
MN95142	57.4	28.0	64	5	70	13.5	1.83	60.1	12.0	0.54	56.2	1	56.5	2.75	1	0	3	4	4	172		

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USDA / ARS WHEAT QUALITY LAB FARGO, ND

LOCATION: Crookston, MN
NURSERY: AY-3

Table 7 (cont.)

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR PRO ASH (14% mb)		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----				LOAF VOL (cc)
						PRO	ASH		PRO	ASH						C	C	G	T	
MN95167	57.2	26.9	44	9	80	13.5	1.81	54.1	11.6	0.52	55.8	2	54.0	3.50	3	0	4	5	5	193
MN95178	58.2	26.3	62	5	70	13.1	1.70	52.1	11.7	0.45	55.8	3	62.0	5.75	3	4	6	5	5	208
MN95184	58.2	30.9	69	1	96	14.1	1.83	54.3	12.4	0.61	55.8	1	60.0	2.00	0	0	3	3	3	162
MN95194	58.0	29.7	54	4	64	14.1	1.74	54.4	12.9	0.43	63.4	3	65.5	2.25	2	4	3	5	5	188
MN95201	58.3	29.0	62	3	65	14.4	1.78	57.8	13.2	0.36	59.6	2	59.5	2.50	3	4	2	6	6	192
MN95206	60.2	33.8	62	2	91	15.0	1.83	62.8	13.9	0.47	61.1	2	63.0	2.25	2	4	4	6	6	198
MN95211	60.2	35.1	86	2	85	14.2	1.65	59.4	12.6	0.53	60.0	2	60.0	3.00	3	4	3	6	6	210
MN95212	58.8	30.9	70	3	87	15.0	1.79	61.7	14.2	0.44	61.4	3	61.5	2.25	2	0	3	6	6	188
MN95222	59.6	30.8	67	3	65	15.6	1.82	60.9	14.6	0.36	59.6	2	57.5	3.00	3	0	3	5	5	204
MN95223	59.1	30.8	73	4	69	14.9	1.74	53.0	13.8	0.35	59.6	3	61.5	3.25	3	4	3	5	5	211
MN95229	61.4	32.4	69	2	73	15.0	1.78	57.3	14.0	0.42	63.7	4	65.5	3.50	3	4	5	5	5	215
MN95230	59.5	28.9	60	4	55	14.1	1.54	57.0	13.6	0.33	59.3	3	61.0	3.25	3	3	2	6	6	220

RATINGS:	0						3		6	
	STICKY-WEAK			PLIABLE			ELASTIC		BUCKY	
	YELLOW			GREY			DULL		BRIGHT WHITE	
	IRREG, THICK			HARSH			OPEN, THICK		FINE	
							COARSE		SILKY	

1996 Spring Wheat Quality Report

USDA / ARS
WHEAT QUALITY LAB

Table 9

LOCATION: St. Paul, MN
NURSERY: AY-3

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D					LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	MIX ABS	MIX PAT					C	C	C	G	T	
CHRIS	60.6	27.6	67	3	75	16.3	1.82	62.1	15.5	0.43	59.6	2	63.5	3.00	3	4	3	4	3	5	5	228
2375	62.2	34.6	80	2	88	15.5	1.81	62.6	13.9	0.40	61.8	3	62.0	3.00	3	3	3	3	3	5	5	198
VERDE	62.5	30.9	76	2	85	14.3	1.76	64.2	12.5	0.44	63.4	3	59.5	3.00	3	4	3	4	3	5	5	192
NORM	62.6	37.9	89	1	88	14.6	1.72	59.8	13.6	0.42	63.4	4	61.5	3.25	3	4	3	4	3	5	5	208
MN95002	62.2	31.2	66	2	87	16.0	1.79	59.6	14.6	0.39	59.0	2	59.0	3.25	3	3	4	3	4	5	5	192
MN95023	60.2	31.8	69	3	75	13.6	1.69	61.4	12.4	0.40	57.6	2	57.5	3.25	3	4	3	4	3	5	5	191
MN95051	62.0	31.1	70	2	88	14.8	1.71	63.6	12.8	0.42	63.7	4	63.5	3.00	3	3	3	3	3	5	5	192
MN95084	61.8	33.9	78	1	85	14.3	1.77	61.1	12.5	0.41	56.2	3	61.5	4.50	3	3	4	3	4	4	4	190
MN95090	61.2	30.5	66	3	62	13.3	1.86	49.1	11.8	0.46	54.6	1	58.8	4.25	3	0	5	6	6	6	6	180
MN95102	59.9	31.2	73	1	88	15.5	1.89	59.4	14.0	0.46	61.1	2	59.0	2.00	3	3	3	3	3	5	5	198
MN95122	60.5	33.2	67	1	82	14.3	1.94	59.0	12.6	0.54	55.3	1	57.0	2.50	3	4	3	4	3	5	5	172
MN95124	63.0	30.1	61	2	27	14.0	2.07	49.0	12.3	0.36	57.3	2	59.0	3.25	3	3	3	3	3	4	4	182
MN95126	60.6	29.5	78	1	32	14.3	1.86	37.5	12.0	0.39	55.3	1	57.0	2.50	2	4	3	4	3	4	4	162
MN95194	60.9	33.1	79	1	67	13.7	1.82	60.7	12.2	0.44	60.0	2	60.0	2.25	2	2	3	3	3	4	4	176
MN95201	61.5	36.0	78	1	74	14.3	1.88	63.4	12.9	0.38	57.9	2	58.0	2.25	3	4	3	4	3	4	4	176
MN95211	60.3	35.0	86	1	92	15.2	1.76	59.0	14.3	0.50	60.8	2	62.8	2.75	2	2	3	3	3	4	4	184
MN95222	60.7	35.1	84	2	71	15.6	1.75	64.5	14.8	0.37	61.1	3	61.0	2.75	3	4	3	4	3	6	6	203
MN95223	60.2	37.6	83	2	70	15.2	1.71	65.7	14.1	0.39	59.6	4	61.5	3.75	3	0	5	6	6	6	6	208
MN95229	62.2	37.0	84	1	80	15.4	1.81	56.7	13.6	0.43	62.5	3	62.5	2.75	3	4	3	4	3	5	5	194
MN95230	62.4	35.2	82	1	58	14.9	1.84	56.9	13.4	0.30	61.1	4	59.0	3.25	3	3	3	3	5	6	6	196

RATINGS:		0						3		6		
		STICKY-WEAK		PLIABLE		ELASTIC		CREAMY		BUCKY		
		YELLOW		GREY		DULL		OPEN, THICK		BRIGHT WHITE		
		IRREG, THICK		HARSH		COARSE		FINE		SILKY		

1996 Spring Wheat Quality Report

LOCATION: Crookston,MN
NURSERY: AY-4

USDA / ARS
WHEAT QUALITY LAB
FARGO, ND

Table 10

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----					LOAF VOL (cc)
						PRO	ASH (14% mb)		PRO	ASH (14 % mb)						C	C	G	T		
CHRIS	55.3	23.0	51	7	79	15.5	1.92	57.7	14.7	0.45	59.6	4	61.5	3.25	3	4	3	5	5	222	
2375	62.2	35.8	75	2	74	14.1	1.74	59.9	12.3	0.38	60.0	3	62.0	3.00	3	4	5	5	5	198	
VERDE	58.6	28.7	63	5	73	13.4	1.77	59.7	11.8	0.42	58.6	4	58.8	3.50	3	3	2	1	1	198	
NORM	54.3	29.4	54	5	64	14.2	1.95	52.3	12.8	0.43	60.3	4	62.5	4.00	3	3	5	4	4	218	
MN95231	58.0	24.6	22	13	65	13.4	1.82	52.1	11.8	0.51	56.2	4	62.5	4.50	3	0	3	4	4	193	
MN95242	55.1	29.2	52	7	54	14.2	1.85	44.2	13.3	0.47	59.6	2	61.5	3.00	3	0	5	4	4	212	
MN95244	60.6	33.9	73	3	80	15.5	1.82	54.8	13.7	0.45	67.7	5	63.5	2.75	3	3	3	6	6	200	
MN95247	56.8	24.2	32	9	58	15.1	2.14	49.3	13.9	0.47	61.8	4	62.0	4.50	3	0	3	4	4	204	
MN95256	58.4	28.7	65	3	56	15.5	2.11	49.8	14.5	0.44	59.6	3	61.5	3.75	3	0	3	5	5	218	
MN95267	59.4	31.8	70	4	88	15.4	1.90	56.9	14.6	0.38	61.4	4	61.5	3.00	3	3	5	4	4	214	
MN95268	56.8	25.4	54	14	70	14.2	1.68	53.5	12.9	0.35	63.4	6	61.5	6.75	3	3	3	5	5	202	
MN95279	57.2	28.0	52	9	59	14.3	1.66	50.0	12.9	0.37	59.6	4	59.5	3.75	3	3	3	4	4	208	
MN95282	58.2	30.0	63	5	72	15.1	1.94	59.3	13.7	0.47	60.3	4	60.5	3.25	3	3	3	4	4	222	
MN95283	57.8	33.1	79	2	66	15.8	1.96	56.1	14.3	0.38	64.7	5	62.8	2.75	3	4	3	4	4	212	
MN95284	59.4	31.2	55	6	73	14.3	1.95	54.8	13.3	0.36	63.4	5	59.5	3.00	3	4	5	4	4	202	
MN95285	61.1	34.1	74	3	73	13.6	1.62	53.9	12.4	0.34	61.4	4	59.5	3.25	3	4	3	5	5	204	
MN95286	61.8	30.5	66	3	100	12.8	1.60	54.8	10.7	0.37	57.9	3	60.0	3.25	3	4	5	4	4	175	
MN95287	53.3	22.4	29	15	87	15.2	2.02	47.9	13.8	0.59	60.5	4	60.5	2.75	3	4	6	4	4	218	
MN95288	57.8	27.2	55	6	89	14.4	1.76	49.3	13.3	0.45	59.6	6	63.5	5.25	3	4	3	5	5	202	
MN95289	58.2	30.3	71	3	60	14.1	1.87	50.5	13.7	0.46	61.8	4	62.0	4.25	3	0	3	4	4	225	
MN95290	58.2	24.6	69	4	70	15.0	1.86	46.5	14.0	0.49	59.6	2	57.5	2.50	2	4	4	4	4	188	
MN95291	60.5	28.2	71	4	66	15.6	2.03	41.9	14.4	0.57	59.3	2	59.0	3.00	3	0	3	5	5	208	
MN95292	58.6	29.5	64	5	78	14.3	1.91	56.5	13.5	0.52	58.2	3	60.5	3.25	3	3	3	5	5	198	
MN95293	58.6	29.1	62	5	77	14.0	1.86	58.3	13.2	0.51	59.6	4	61.5	3.25	3	0	5	5	5	204	

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USDA / ARS
WHEAT QUALITY LAB

Table 10 (cont.)

LOCATION: Crookston, MN
NURSERY: AY-4

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	Rating-----					LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	FLOUR							C	C	C	G	T	
									PRO	ASH (14 % mb)											
MN95294	56.6	28.5	56	7	74	15.2	1.97	57.4	14.5	0.53	59.3	4	61.0	3.75	3	0	3	5	5	210	
MN95295	57.0	33.2	57	7	77	15.3	1.97	56.0	14.3	0.51	59.3	4	61.0	3.25	3	3	5	5	5	208	
MN95296	58.3	29.4	67	5	80	14.5	1.87	53.7	13.2	0.53	58.6	4	58.8	3.50	3	4	2	5	5	194	
MN95297	56.8	24.3	67	3	74	15.0	1.85	56.7	13.9	0.49	62.7	4	62.8	3.75	3	4	3	5	5	210	
MN95298	56.8	26.1	43	8	81	15.4	1.84	56.0	13.9	0.52	61.1	4	61.0	4.00	3	4	3	5	5	226	
MN95299	59.0	28.0	65	3	58	14.9	1.83	55.8	14.0	0.40	61.4	3	59.5	2.50	3	3	3	4	4	208	
MN95300	57.4	29.5	57	8	78	13.2	1.68	50.7	12.1	0.44	60.8	3	58.8	2.50	3	3	3	4	4	212	
MN95301	60.7	28.7	65	4	96	14.1	1.81	50.5	12.1	0.49	62.7	2	60.8	2.75	3	4	3	4	4	202	
MN95302	57.2	30.1	67	4	82	14.6	1.80	56.9	13.3	0.45	59.0	2	61.0	2.25	2	4	3	5	5	177	
MN95303	61.5	36.4	82	2	72	13.7	1.76	49.3	12.6	0.46	59.3	2	61.0	3.25	3	4	5	5	5	202	
MN95304	58.6	32.5	56	4	81	16.0	1.83	59.1	14.9	0.40	62.5	4	60.5	3.00	3	3	5	5	5	232	
MN95305	56.8	30.4	64	4	65	14.2	1.70	56.0	13.5	0.43	60.5	4	60.5	3.25	3	4	3	5	5	201	

RATINGS:	0						3		6	
	DOUGH CHAR (DC):		STICKY-WEAK		PLIABLE		ELASTIC		BUCKY	
	CRUMB COLOR (CC):		YELLOW		GREY		DULL		BRIGHT WHITE	
	CRUMB GRAIN (CG):		IRREG, THICK		OPEN, THICK		COARSE		FINE	
	CRUMB TEXTURE (CT):		HARSH						SILKY	

Table 11

**USDA / ARS
AT QUALITY
FARGO, ND**

	0	3	6
RATINGS:			
DOUGH CHAR (DC):	STICKY-WEAK	PLIABLE	ELASTIC
CRUMB COLOR (CC):	YELLOW	GREY	CREAMY
CRUMB GRAIN (CG):	IRREG, THICK		OPEN, THICK
CRUMB TEXTURE (CT):	HARSH		COARSE
			BUCKY
			BRIGHT WHITE
			FINE
			SILKY

DOUGH CHAR (DC):
CRUMB COLOR (CC):
CRUMB GRAIN (CG):
CRUMB TEXTURE (CT):

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USDA / ARS
WHEAT QUALITY LAB

Table 12

LOCATION: St. Paul, MN
NURSERY: AY-4

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating				LOAF VOL (cc)
						PRO	ASH (14% mb)		PRO	ASH (14% mb)						C	C	C	G	
CHRIS	60.6	28.4	68	2	80	16.2	1.85	61.6	15.3	0.47	61.4	4	63.5	2.75	3	3	6	6	6	217
2376	62.2	36.5	79	2	85	15.8	1.85	60.9	14.1	0.42	59.3	3	61.0	3.00	3	3	3	3	6	192
VERDE	60.9	33.3	76	2	88	14.4	1.80	65.1	12.9	0.43	58.6	2	58.8	3.00	3	4	5	4	4	201
NORM	62.0	38.9	89	1	93	14.5	1.77	62.8	13.6	0.44	62.5	4	64.5	3.50	3	0	5	5	5	212
MN95231	62.4	32.2	75	3	80	14.2	1.72	61.0	12.4	0.44	60.3	3	62.5	4.00	3	4	3	5	5	192
MN95244	61.6	36.1	73	2	86	14.1	1.85	62.2	12.7	0.53	62.5	4	64.5	3.00	3	3	5	5	5	202
MN95267	60.3	36.0	79	1	91	15.1	1.75	60.6	14.1	0.46	62.7	4	60.8	2.75	3	5	3	4	4	202
MN95268	59.8	30.5	54	5	80	14.1	1.84	60.7	12.8	0.43	61.4	7	63.5	5.75	3	0	3	5	5	192
MN95284	61.0	32.1	70	3	78	14.5	1.71	66.4	13.7	0.42	63.1	3	63.0	3.00	3	2	3	6	6	218
MN95285	61.3	35.5	84	1	79	14.5	1.65	62.4	13.5	0.41	62.7	3	64.8	2.75	3	4	4	5	5	214
MN95286	61.8	31.8	72	2	79	13.8	1.76	63.8	12.3	0.51	57.9	2	60.0	3.00	2	4	3	6	6	188
MN95288	62.2	34.5	80	2	89	14.8	1.77	61.1	13.6	0.42	59.6	5	63.5	7.00	3	4	3	6	6	200
MN95290	62.6	41.2	92	1	90	15.1	1.77	63.1	13.9	0.43	57.6	2	57.5	3.00	3	3	3	5	5	192
MN95299	63.1	34.1	83	2	75	15.3	1.75	62.7	14.1	0.39	57.9	2	60.0	2.50	3	4	5	5	5	194
MN95303	58.6	34.5	82	1	77	14.9	1.79	56.9	14.0	0.46	58.6	2	60.8	2.50	3	4	3	5	5	202
MN95304	60.6	37.6	84	2	88	15.4	1.85	64.2	14.5	0.42	59.3	3	61.0	3.25	3	4	3	5	5	215

RATINGS:	0			3		6
	DOUGH CHAR (DC):	STICKY-WEAK	PLIABLE	ELASTIC	BUCKY	
	CRUMB COLOR (CC):	YELLOW	GREY	DULL	BRIGHT WHITE	
	CRUMB GRAIN (CG):	IRREG, THICK		OPEN, THICK	FINE	
	CRUMB TEXTURE (CT):	HARSH		COARSE	SILKY	

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USDA / ARS
WHEAT QUALITY LAB

Table 13

LOCATION: *Brookings,SD*
NURSERY: *AYT*

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D					C					LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	FLOUR						MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	C	C	C	G	T	
									PRO	ASH (14 % mb)															
CHRIS	61.3	29.3	73	1	80	11.8	1.54	60.4	11.1	0.40	57.3	3	61.0	3.50	3	3	3	3	3	5	5	172			
BUTTE 86	63.1	35.5	91	0	89	11.3	1.51	61.9	10.2	0.37	58.6	3	62.8	3.25	3	3	3	3	5	4	4	153			
PROSPECT	61.8	32.7	79	1	63	10.9	1.63	53.9	10.1	0.37	51.6	1	53.5	5.00	3	4	3	4	3	1	1	149			
SHARP	63.9	34.9	90	1	73	11.3	1.49	56.4	10.2	0.33	55.5	2	57.5	4.00	3	3	3	3	4	4	151				
2375	63.1	37.2	89	1	75	10.8	1.55	54.0	9.8	0.36	55.8	4	60.0	4.50	3	4	3	4	3	5	5	158			
RUSS	61.8	36.2	90	1	77	10.7	1.58	59.2	9.7	0.36	55.0	4	61.0	5.00	2	4	3	4	3	4	4	144			
OXEN	62.5	31.9	89	2	79	10.9	1.51	63.4	10.0	0.32	56.5	4	60.5	5.75	3	3	5	3	4	4	151				
SD3156	64.3	33.5	83	1	73	10.8	1.63	61.0	10.0	0.32	55.3	2	57.0	4.50	3	4	5	1	5	1	152				
SD8089	61.4	31.3	77	2	80	10.5	1.45	54.1	8.7	0.34	52.2	1	56.5	4.00	3	4	5	4	5	4	160				
SD3219	63.8	34.9	85	1	72	10.4	1.54	53.2	9.0	0.38	51.6	1	53.5	5.25	3	4	4	1	4	1	150				
SD3236	62.8	34.7	78	0	85	11.7	1.54	53.9	9.9	0.33	53.8	2	58.0	4.75	3	3	5	1	5	1	150				
SD3249	64.5	33.2	83	0	76	11.7	1.60	59.9	10.7	0.34	55.8	3	60.0	4.50	3	3	3	1	3	1	152				
SD8108	63.5	33.5	82	1	61	10.7	1.51	54.8	9.8	0.34	53.5	3	59.5	6.25	3	3	5	4	5	4	152				
SD3283	64.6	36.2	90	0	63	10.9	1.55	58.3	10.0	0.32	53.8	2	58.0	4.00	3	3	3	4	3	4	158				
SD3285	63.0	34.0	82	1	63	10.2	1.61	51.8	9.1	0.34	50.8	1	54.8	4.50	3	3	5	1	5	1	140				
SD3286	62.7	33.6	84	1	65	10.3	1.51	50.7	9.3	0.34	51.6	1	55.5	5.00	3	3	5	1	5	1	148				
SD3292	62.8	36.5	89	0	72	10.6	1.57	58.0	9.1	0.35	55.3	2	59.0	4.25	3	3	3	1	3	1	154				
SD3305	63.8	33.2	81	1	66	10.9	1.52	56.7	10.3	0.33	54.6	2	56.8	3.75	3	4	3	1	3	1	170				
SD3306	62.0	34.3	87	1	74	10.1	1.46	56.7	8.8	0.33	51.9	1	56.0	4.00	3	4	4	4	4	4	154				
SD3310	64.3	34.2	89	1	54	10.6	1.51	61.4	10.2	0.30	55.5	2	57.5	4.25	3	3	3	4	3	4	166				

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USDA / ARS
WHEAT QUALITY LAB

LOCATION: Brookings, SD
NURSERY: AYT

Table 13 (cont.)

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR PRO ASH (14 % mb)		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----				LOAF VOL (cc)
						PRO	ASH		PRO	ASH						C	C	C	C	
SD3329	63.4	33.1	87	0	75	11.5	1.52	61.9	10.5	0.29	55.5	2	59.5	3.00	3	3	3	3	5	180
SD8119	62.2	33.4	92	0	84	10.5	1.52	58.3	9.2	0.31	52.2	3	58.5	5.75	2	3	3	3	4	160

RATINGS:		0		3		6	
		STICKY-WEAK	PLIABLE	ELASTIC	CREAMY	BUCKY	
DOUGH CHAR (DC):		YELLOW	GREY	DULL	OPEN, THICK	BRIGHT WHITE	
CRUMB COLOR (CC):		IRREG, THICK		COARSE		FINE	
CRUMB GRAIN (CG):						SILKY	
CRUMB TEXTURE (CT):							

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USDA / ARS WHEAT QUALITY LAB

Table 14

LOCATION: Day Co., SD
NURSERY: AYT

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX		BAKE ABS	MIX TIME (min)	D		C		LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	ABS	PAT			C	C	G	T	
CHRIS	61.1	28.5	59	3	80	15.8	1.57	63.7	15.3	0.41	59.3	1	57.0	2.75	3	3	4	4	195
BUTTE 86	62.6	34.4	80	1	93	14.3	1.52	62.6	13.1	0.37	59.0	1	59.0	2.50	2	4	5	5	189
PROSPECT	61.2	33.6	72	1	67	14.7	1.59	56.9	14.0	0.38	55.5	1	55.5	2.75	3	4	5	4	198
SHARP	63.4	34.2	81	1	75	14.2	1.47	58.4	13.5	0.36	58.6	1	58.8	2.50	3	4	5	5	182
2375	62.1	36.6	77	1	80	15.1	1.62	59.0	13.7	0.38	55.8	1	56.0	3.25	3	4	5	5	192
RUSS	62.4	36.0	82	1	87	14.2	1.52	61.0	13.2	0.42	49.2	1	57.0	4.25	3	0	6	5	190
OXEN	60.9	29.1	60	3	86	14.2	1.51	63.9	12.7	0.34	55.3	2	59.0	4.25	3	3	5	5	208
SD3156	63.8	30.7	75	2	72	13.9	1.48	59.7	13.0	0.33	56.2	2	58.5	3.50	3	3	4	5	198
SD8089	61.3	30.2	64	4	77	14.1	1.56	59.9	12.9	0.41	54.3	1	56.5	3.50	3	4	5	5	191
SD3219	64.2	34.0	75	1	86	13.9	1.49	54.2	11.9	0.39	53.2	1	57.0	4.00	2	4	6	4	188
SD3236	62.9	33.2	70	1	85	14.2	1.94	50.7	11.7	0.34	54.3	1	56.5	3.00	3	3	5	5	188
SD3249	64.2	32.2	65	1	78	14.9	1.59	59.6	13.8	0.32	57.9	2	62.0	3.75	3	4	3	6	202
SD8108	63.4	33.1	68	1	59	13.9	1.58	58.1	13.0	0.30	56.2	2	60.5	4.25	3	3	3	6	210
SD3283	63.9	35.2	79	0	69	14.2	1.47	51.8	13.0	0.30	53.5	1	57.5	3.50	3	4	3	6	193
SD3285	62.7	34.8	74	2	80	14.1	1.48	47.7	12.4	0.34	55.3	1	57.0	2.75	2	3	5	5	198
SD3286	62.8	32.4	72	2	74	13.9	1.56	55.6	12.9	0.40	53.2	1	57.0	2.75	2	3	3	6	198
SD3292	63.0	35.1	84	1	91	14.1	1.56	62.2	12.4	0.30	56.9	1	58.8	2.25	2	3	6	6	202
SD3305	62.9	32.0	70	2	81	15.0	1.70	61.5	13.9	0.29	57.3	1	57.0	2.25	2	4	5	5	182
SD3306	62.0	34.5	80	2	86	14.7	1.51	58.4	13.1	0.38	55.3	1	57.0	2.75	2	3	5	5	184
SD3310	64.2	33.8	81	1	66	14.6	1.49	54.2	13.3	0.35	55.0	1	57.0	2.75	2	0	5	6	192

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LOCATION: Day Co., SD
NURSERY: AYT

USDA / ARS WHEAT QUALITY LAB FARGO, ND

Table 14 (cont.)

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR PRO ASH (14 % mb)		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----			LOAF VOL (cc)
						PRO	ASH (14% mb)		PRO	ASH (14 % mb)						D	C	C	
SD3329	63.0	32.7	75	1	72	13.6	1.57	59.7	12.1	0.38	53.8	1	56.0	2.50	2	5	3	5	183
SD8119	62.8	34.4	84	1	89	13.6	1.75	61.3	12.3	0.44	55.5	1	57.5	2.75	2	3	3	4	200

		0	3	6
RATINGS:	DOUGH CHAR (DC):	STICKY-WEAK	PLIABLE	ELASTIC
	CRUMB COLOR (CC):	YELLOW	GREY	DULL
	CRUMB GRAIN (CG):	IRREG, THICK	OPEN, THICK	COARSE
	CRUMB TEXTURE (CT):	HARSH		
				BUCKY BRIGHT WHITE FINE SILKY

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USDA / ARS
WHEAT QUALITY LAB

Table 15

LOCATION: Groton,SD
NURSERY: AYT

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating					LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)						C	C	C	G	T	
CHRIS	58.7	25.5	53	6	82	15.6	1.89	55.8	14.8	0.32	57.9	2	60.0	2.75	3	3	4	4	4	4	210
BUTTE 86	60.2	31.4	69	2	88	14.3	1.86	57.7	12.9	0.38	59.0	2	61.0	3.00	3	4	5	4	4	4	188
PROSPECT	60.9	33.0	72	2	67	14.1	1.81	58.3	11.8	0.36	56.2	2	58.5	2.50	3	3	5	4	4	4	194
SHARP	61.3	31.1	64	4	76	14.2	1.83	56.7	12.8	0.35	58.6	2	60.8	3.00	3	3	5	4	4	4	198
2375	60.4	31.7	59	4	84	14.1	1.82	55.0	12.6	0.46	60.0	3	60.0	3.25	3	3	3	5	5	5	194
RUSS	59.5	30.7	68	4	94	13.6	1.84	53.9	12.0	0.46	59.6	3	59.5	3.50	3	3	5	5	5	5	198
OXEN	60.5	28.7	57	5	89	13.7	1.86	62.2	12.3	0.41	56.9	3	58.8	4.00	3	3	6	4	4	4	190
SD3156	61.4	29.1	54	4	77	14.1	2.03	58.3	12.9	0.43	59.3	2	61.0	3.50	3	3	4	4	4	4	195
SD8089	58.2	29.0	42	9	75	14.0	1.72	56.4	12.6	0.49	56.2	2	58.5	4.00	3	3	4	5	5	5	198
SD3219	61.8	31.5	68	8	84	13.3	1.76	52.1	11.7	0.35	53.5	2	57.5	5.00	3	4	3	4	4	4	186
SD3236	61.3	30.9	61	3	93	14.0	1.85	51.8	11.6	0.42	58.2	3	60.5	4.00	3	3	3	4	4	4	180
SD3249	62.2	28.7	51	6	76	14.1	1.85	56.7	13.1	0.43	59.3	4	59.0	4.00	3	3	4	5	5	5	198
SD8108	61.5	30.6	59	4	59	13.1	1.77	55.3	12.1	0.41	58.6	4	60.8	4.00	3	3	3	5	5	5	192
SD3283	62.4	32.1	71	3	58	13.7	1.83	53.9	12.6	0.37	57.9	2	58.0	3.00	3	5	3	4	4	4	218
SD3285	60.8	29.8	71	3	67	13.3	1.84	49.5	11.3	0.45	53.5	1	55.5	3.25	3	3	3	4	4	4	181
SD3286	60.9	30.7	69	3	87	13.5	1.86	56.7	12.3	0.44	53.6	1	55.5	3.25	3	4	6	4	4	4	185
SD3292	60.6	32.1	69	3	84	14.0	1.83	57.5	12.5	0.37	59.0	2	59.0	2.75	3	3	3	4	4	4	203
SD3305	61.0	29.9	53	6	75	14.6	1.98	56.4	13.1	0.38	56.2	2	56.5	2.75	3	4	3	4	4	4	198
SD3306	60.5	28.2	69	4	86	13.9	1.64	58.8	12.6	0.39	56.9	2	58.8	2.75	3	4	6	4	4	4	202
SD3310	62.9	31.9	73	3	67	13.7	1.75	56.7	11.7	0.34	58.2	2	58.5	3.00	3	3	4	4	4	4	195

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LOCATION: *Groton, SD*
 NURSERY: *AYT*

USDA / ARS WHEAT QUALITY LAB FARGO, ND

Table 15 (cont.)

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR PRO ASH (14 % mb)		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----				LOAF VOL (cc)
						PRO	ASH		PRO	ASH						C	C	C	C	
SD3329	61.9	31.7	68	3	77	13.9	1.77	54.8	13.2	0.30	55.0	1	57.0	3.00	3	3	3	3	4	192
SD8119	60.6	31.4	73	3	89	14.0	1.91	58.7	12.6	0.39	56.5	2	58.5	3.25	3	3	3	3	4	202

RATINGS:				0		3		6	
DOUGH CHAR (DC): CRUMB COLOR (CC): CRUMB GRAIN (CG): CRUMB TEXTURE (CT):	STICKY-WEAK	PLIABLE	ELASTIC	STICKY-WEAK		ELASTIC		BUCKY	
	YELLOW	GREY	DULL	YELLOW		DULL		BRIGHT WHITE	
	IRREG, THICK	OPEN, THICK	COARSE	IRREG, THICK		OPEN, THICK		FINE	
	HARSH			HARSH		COARSE		SILKY	

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USDA / ARS
WHEAT QUALITY LAB

Table 16

LOCATION: *Selby, SD*
NURSERY: *AYT*

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating					LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	FLOUR							C	C	C	T		
									PRO	ASH (14 % mb)											
CHRIS	62.2	26.4	58	2	79	12.4	1.50	59.4	11.6	0.35	55.5	3	57.5	4.00	3	3	3	4	4	183	
BUTTE 86	63.7	32.1	82	1	84	11.9	1.52	57.5	10.5	0.41	56.9	2	58.8	4.00	3	3	5	4	4	168	
PROSPECT	62.6	29.7	68	1	64	11.4	1.53	49.5	10.5	0.44	50.2	1	54.5	4.00	2	4	5	4	4	161	
SHARP	64.3	30.6	75	1	72	11.9	1.52	53.7	11.1	0.36	55.0	2	57.0	3.00	2	3	3	5	5	172	
2375	62.6	32.7	70	2	80	11.4	1.53	54.6	10.3	0.38	56.5	4	58.5	4.00	3	3	3	4	4	162	
RUSS	62.9	32.4	72	2	80	11.0	1.48	59.9	9.9	0.38	57.3	4	61.0	4.50	2	0	5	5	5	170	
OXEN	62.6	31.4	73	2	78	11.4	1.41	61.3	10.2	0.33	55.8	3	58.0	5.25	3	3	3	4	4	170	
SD3156	64.2	31.0	78	2	71	11.2	1.53	53.9	9.8	0.33	54.6	2	56.8	4.75	3	4	2	5	5	158	
SD8089	61.7	28.5	61	3	74	11.0	1.46	53.2	9.6	0.40	53.5	2	55.5	3.75	2	4	3	4	4	162	
SD3219	63.9	31.0	76	1	79	10.3	1.41	56.0	8.8	0.36	49.9	1	56.0	6.00	2	0	3	2	2	155	
SD3236	62.6	30.9	59	1	80	11.8	1.52	55.0	10.3	0.34	54.3	2	58.5	5.25	3	5	2	2	2	168	
SD3249	64.4	29.2	65	2	70	11.9	1.49	58.1	11.2	0.33	56.9	3	58.6	4.75	3	0	2	5	5	180	
SD8108	63.5	31.2	67	2	55	11.0	1.45	50.2	10.3	0.33	51.9	2	58.0	6.50	3	0	2	5	5	170	
SD3283	65.2	34.3	83	1	66	11.3	1.31	54.8	10.3	0.32	53.5	2	57.5	4.25	3	3	3	4	4	168	
SD3285	63.1	29.1	67	2	64	10.7	1.36	50.7	10.0	0.35	53.2	2	57.0	4.25	2	3	3	5	5	160	
SD3286	63.0	30.7	68	2	66	10.8	1.40	54.6	10.2	0.36	51.6	2	57.5	5.00	2	0	5	4	4	152	
SD3292	63.5	31.9	79	1	78	11.5	1.47	60.3	10.3	0.35	55.8	2	58.0	4.00	3	3	3	4	4	166	
SD3305	63.5	30.8	68	1	59	11.3	1.36	55.5	10.5	0.35	52.9	2	56.8	4.50	3	4	3	4	4	171	
SD3306	62.5	29.8	77	2	71	10.6	1.33	59.6	9.4	0.37	55.0	2	59.0	3.50	3	3	3	5	5	169	
SD3310	64.6	31.3	82	1	60	10.8	1.37	57.1	10.7	0.33	55.5	2	57.5	4.50	3	0	3	4	4	175	

1996 Spring Wheat Quality Report

LOCATION: *Selby, SD*
 NURSERY: *AYT*

USDA / ARS WHEAT QUALITY LAB FARGO, ND

Table 16 (cont.)

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----				LOAF VOL (cc)
						PRO	ASH (14% mb)		PRO	ASH (14 % mb)						C	C	C	C	
SD3329	63.0	32.6	80	1	61	11.7	1.43	60.8	11.1	0.34	53.2	2	55.0	3.50	3	3	3	3	5	185
SD8119	62.1	30.8	76	2	78	10.9	1.53	56.2	9.6	0.39	52.2	1	58.5	5.50	3	4	3	4	4	166

RATINGS:	0			3			6		
	DOUGH CHAR (DC):	STICKY-WEAK	PLIABLE	ELASTIC	BUCKY	DOUGH CHAR (DC):	STICKY-WEAK	PLIABLE	ELASTIC
CRUMB COLOR (CC):	CRUMB COLOR (CC):	YELLOW	GREY	DULL	BRIGHT WHITE	CRUMB COLOR (CC):	YELLOW	GREY	DULL
CRUMB GRAIN (CG):	CRUMB GRAIN (CG):	IRREG, THICK	OPEN, THICK	COARSE	FINE	CRUMB GRAIN (CG):	IRREG, THICK	OPEN, THICK	COARSE
CRUMB TEXTURE (CT):	CRUMB TEXTURE (CT):	HARSH	COARSE	COARSE	SILKY	CRUMB TEXTURE (CT):	HARSH	COARSE	COARSE

1996 Spring Wheat Quality Report

LOCATION: Casselton, ND
NURSERY: Field Plots

USDA / ARS WHEAT QUALITY LAB FARGO, ND

Table 17

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----				LOAF VOL (cc)
						PRO	ASH (14% mb)		PRO	ASH (14% mb)						C	C	C	T	
Butte 86	60.7	36.0	85	0	110	15.1	1.55	70.9	13.7	0.41	61.1	2	60.3	2.75	2	3	3	5	5	850
Grandin	60.9	38.5	89	0	106	14.8	1.58	74.8	13.8	0.44	62.5	4	61.5	3.50	3	3	3	4	4	950
Keene	61.5	32.1	68	1	107	14.3	1.51	73.6	13.6	0.38	60.8	3	59.9	3.50	3	3	5	4	4	920
Kulm	63.4	35.2	84	0	97	15.5	1.59	73.1	14.4	0.35	62.7	3	61.8	3.00	3	3	3	5	5	985
Trenton	61.5	35.5	87	1	92	14.3	1.47	74.3	13.5	0.42	62.5	4	61.5	4.00	3	3	3	5	5	935
2375	62.0	40.8	86	0	103	14.4	1.57	74.1	13.3	0.43	60.0	3	59.1	3.25	2	3	3	5	5	845

RATINGS:	0						3		6	
	STICKY-WEAK			PLIABLE			ELASTIC		CREAMY	
	YELLOW			GREY			DULL		BRIGHT WHITE	
	IRREG, THICK			HARSH			OPEN, THICK		FINE	
							COARSE		SILKY	

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USDA / ARS
WHEAT QUALITY LAB
FARGO, ND

Table 18

LOCATION: Langdon, ND
NURSERY: Field Plots

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR EXT (%)	FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating					LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	PRO		ASH (14 % mb)	C						C	G	T			
Amidon	57.0	27.5	47	6	96	13.7	1.60	70.1	13.1	0.45	60.3	3	59.5	2.50	2	3	3	5	5	915		
Butte 86	58.0	29.3	55	2	83	14.0	1.72	70.9	13.2	0.44	61.4	3	60.6	2.75	2	3	5	5	5	910		
Grandin	57.9	28.6	57	3	77	14.4	1.80	72.5	13.6	0.48	60.3	4	59.5	3.75	3	3	3	5	5	940		
Keene	57.8	26.7	42	7	79	14.8	1.72	71.8	13.9	0.46	60.5	2	59.5	2.50	1	3	3	3	3	850		
Kulm	57.8	26.4	48	5	69	15.2	1.82	71.1	14.5	0.48	62.7	3	61.6	2.50	2	3	1	4	4	890		
Norm	53.8	25.1	42	6	57	13.7	1.84	72.7	12.8	0.53	59.6	3	58.4	3.25	1	3	5	4	4	960		
CDC Teal	57.9	30.7	66	2	79	15.4	1.66	73.4	14.7	0.43	61.4	3	60.3	2.50	2	3	3	4	4	960		
Trenton	57.7	32.9	68	2	75	14.6	1.82	72.9	13.9	0.47	61.8	4	60.5	3.75	2	3	3	4	4	925		
2375	58.3	30.5	51	4	71	14.5	1.82	73.7	13.7	0.47	61.1	4	60.2	2.75	2	3	4	4	4	875		

RATINGS:		0			3			6		
		STICKY-WEAK		PLIABLE	ELASTIC		CREAMY		BUCKY	
DOUGH CHAR (DC):		YELLOW		GREY	DULL		OPEN, THICK		BRIGHT WHITE	
CRUMB COLOR (CC):		IRREG, THICK			COARSE					
CRUMB GRAIN (CG):		HARSH							FINE	
CRUMB TEXTURE (CT):									SILKY	

1996 Spring Wheat Quality Report

LOCATION: *Minot, ND*
 NURSERY: *Field Plots*

USDA / ARS WHEAT QUALITY LAB FARGO, ND

Table 19

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating				LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)						C	C	C	T	
Amidon	61.6	37.5	87	0	111	15.4	1.39	70.7	14.5	0.39	63.4	3	62.7	2.25	2	3	3	4	4	940
Butte 86	61.4	35.8	86	0	90	15.2	1.52	71.5	13.9	0.39	62.5	3	61.6	2.25	2	3	3	5	5	840
Ernest	61.7	36.8	83	1	77	15.8	1.52	74.2	15.1	0.39	63.7	3	62.8	2.50	3	3	3	5	5	970
Grandin	62.3	39.4	91	0	87	15.1	1.56	74.1	14.2	0.43	65.1	4	64.0	3.00	3	3	5	5	5	960
Glu Pro	58.9	39.7	84	1	101	19.2	1.77	74.7	18.6	0.48	67.1	4	65.7	3.00	3	3	5	5	5	1050
Keene	62.2	33.3	74	1	88	15.7	1.45	72.5	14.9	0.39	65.1	3	64.0	2.50	3	3	3	6	6	1030
Kulm	62.3	35.1	81	1	90	15.3	1.55	73.7	14.6	0.40	65.7	3	64.6	2.50	3	3	3	5	5	1020
Stoa	61.2	34.2	89	1	85	15.2	1.54	74.4	14.4	0.40	62.1	3	61.0	3.00	3	3	5	5	5	925
CDC Teal	61.0	36.0	86	0	86	16.0	1.52	74.2	15.5	0.40	63.7	3	62.6	2.25	3	3	5	5	5	980
Trenton	62.7	38.3	88	0	86	15.2	1.48	74.5	14.4	0.34	63.4	3	62.3	3.25	3	3	5	5	5	975
2375	62.4	39.8	85	1	77	15.0	1.44	74.3	14.1	0.33	60.8	2	59.8	2.25	2	3	4	5	5	895

RATINGS:	0			3			6		
	STICKY-WEAK			PLIABLE			ELASTIC		
	YELLOW			GREY			DULL		
	IRREG, THICK			OPEN, THICK			COARSE		
DOUGH CHAR (DC):									
CRUMB COLOR (CC):									
CRUMB GRAIN (CG):									
CRUMB TEXTURE (CT):									
	BUCKY			CREAMY			BRIGHT WHITE		
							FINE		
							SILKY		

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Table 20

LOCATION: Crookston, MN
NURSERY: Special

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR PRO ASH (14 % mb)		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	-----Rating-----				LOAF VOL (cc)
						PRO	ASH		PRO	ASH					D	C	C	C	
VERDE	57.9	27.8	62	4	76	13.3	1.83	62.1	12.2	0.33	60.3	3	58.5	3.25	3	0	5	5	202
GRANDIN	62.3	26.2	88	1	80	14.7	1.70	64.5	13.1	0.31	60.5	4	64.5	3.00	2	0	5	6	220
MCI961	62.6	30.4	70	3	79	11.8	1.74	51.6	10.6	0.49	55.3	2	59.0	4.25	2	3	6	6	198
MCI962	60.3	31.2	71	3	71	13.5	1.62	59.4	12.7	0.39	55.5	2	59.5	3.50	2	4	5	6	190
MCI963	57.6	30.3	65	5	73	12.4	1.80	56.4	11.2	0.42	53.8	2	60.0	3.25	2	3	3	5	182
MCI964	56.6	28.9	72	2	66	14.6	2.12	56.9	13.5	0.38	60.5	3	62.5	3.25	3	4	6	6	210
MCI965	61.0	37.7	85	1	75	13.6	1.80	58.3	12.3	0.39	59.6	4	61.5	3.50	3	4	3	6	228
MCI966	59.5	26.3	46	6	74	14.0	1.78	60.8	12.5	0.33	56.2	2	58.5	3.00	3	0	6	6	202
MCI967	56.5	31.2	62	5	61	15.1	1.90	49.5	13.8	0.40	61.1	4	65.0	3.75	3	0	4	6	226

RATINGS:	0						3		6	
	DOUGH CHAR (DC):	STICKY-WEAK	PLIABLE	ELASTIC	BUCKY					
	CRUMB COLOR (CC):	YELLOW	GREY	DULL	CREAMY	BRIGHT WHITE				
	CRUMB GRAIN (CG):	IRREG, THICK		OPEN, THICK		FINE				
	CRUMB TEXTURE (CT):	HARSH		COARSE		SILKY				

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USDA / ARS
WHEAT QUALITY LAB
FARGO, ND

Table 21

LOCATION: St. Paul, MN
NURSERY: Special

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX		BAKE		MIX TIME (min)	D		C		Rating		LOAF VOL (cc)
					HARD- NESS	PRO (14% mb)	ASH (14% mb)	EXT (%)	PRO (14 % mb)	ASH (14 % mb)	ABS	PAT	ABS	MIX	ABS	TIME	C	C	C	G	T	C	T	
VERDE	60.5	30.8	73	3	80	14.7	1.81	62.7	13.1	0.36	57.6	2	57.5	3.75	3	3	3	3	3	3	5	5	5	200
GRANDIN	57.9	28.2	65	4	86	16.1	2.04	54.8	14.1	0.42	57.3	3	61.0	4.75	3	3	3	3	3	5	4	4	4	200
MCI961	60.9	36.0	89	1	79	12.5	1.75	57.6	11.5	0.37	56.5	2	58.5	4.25	3	4	5	4	5	4	4	4	4	194
MCI962	60.2	33.6	81	1	85	14.7	1.71	60.7	13.2	0.34	56.5	2	58.5	3.25	3	4	5	5	4	5	5	5	5	202
MCI963	59.0	32.9	68	2	82	13.9	1.78	61.3	12.4	0.37	57.6	2	55.5	3.50	3	0	3	5	198					
MCI964	59.9	33.4	81	0	76	14.2	1.87	56.2	12.8	0.37	59.0	3	61.0	3.75	3	3	4	5	200					
MCI965	60.9	35.5	88	0	82	13.9	1.71	62.8	12.3	0.34	59.3	3	61.0	3.25	3	3	2	6	192					
MCI966	59.3	23.5	45	10	66	14.7	1.91	62.3	13.2	0.33	59.3	3	59.0	3.50	3	0	3	5	210					
MCI967	60.9	31.9	76	2	66	14.5	1.78	63.4	12.8	0.35	62.1	4	64.0	3.75	3	0	3	6	228					

RATINGS:		0			3			6		
		STICKY-WEAK			PLIABLE			ELASTIC		
		DOUGH CHAR (DC):			GREY			DULL		
		CRUMB COLOR (CC):			IRREG, THICK			OPEN, THICK		
		CRUMB GRAIN (CG):			COARSE			BRIGHT WHITE		
		CRUMB TEXTURE (CT):			COARSE			FINE		
		HARSH			COARSE			SILKY		

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 22

LOCATION: <i>Carrington, ND</i>											FARGO, ND											
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating				LOAF VOL (cc)
					HARD- NESS	NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	C						C	C	G	T	
Marquis	61.0	28.8	62	1	61	13.2	1.85	13.2	60.6	12.6	0.43	59.3	3	57.3	3.50	2	4	5	4	5	4	173
Chris	59.5	27.4	56	2	71	14.3	1.76	14.3	63.6	13.8	0.40	59.0	3	59.0	3.50	2	3	5	5	4	4	188
Era	58.2	27.2	50	2	63	13.2	1.79	13.2	65.7	12.4	0.44	57.3	2	57.1	4.00	3	3	4	4	4	4	200
Stoa	57.0	26.3	39	3	54	14.6	1.86	14.6	63.0	14.4	0.38	62.5	4	60.5	4.00	3	4	5	5	5	5	202
Butte 86	61.4	36.9	86	0	61	14.6	1.80	14.6	63.4	13.8	0.30	60.0	3	60.0	3.00	3	4	3	6	3	6	191
SD8089	57.8	25.2	27	6	53	14.6	1.77	14.6	52.3	14.5	0.43	59.6	3	57.6	3.75	3	4	3	5	3	5	206
SD3219	62.2	31.2	65	2	62	14.1	1.79	14.1	66.7	13.1	0.41	59.0	3	59.0	4.50	3	4	3	5	3	5	197
SD3236	60.7	33.1	70	1	67	15.0	1.78	15.0	60.7	14.3	0.36	59.6	2	59.6	3.50	3	5	2	5	5	5	206
SD3249	63.7	32.9	75	1	59	14.8	1.84	14.8	65.0	14.2	0.32	61.4	4	59.7	3.50	2	3	3	6	3	6	203
SD8108	61.3	31.7	67	1	46	13.7	1.84	13.7	60.7	13.3	0.31	57.4	3	57.4	5.00	3	3	3	5	3	5	200
SBE0050	61.8	28.8	40	4	42	13.3	1.82	13.3	64.0	12.6	0.34	59.0	3	59.0	4.50	3	3	5	5	3	5	208
MN91309	61.6	34.6	65	1	61	14.2	1.81	14.2	65.0	13.7	0.33	62.5	4	60.2	4.00	2	5	5	5	5	5	200
MN91227	61.4	30.4	67	1	53	13.3	1.75	13.3	61.4	12.6	0.39	55.5	2	55.5	3.00	2	4	5	4	5	4	187
MN93413	57.8	31.0	47	3	60	12.3	1.72	12.3	63.3	11.4	0.35	56.5	2	56.5	3.75	2	4	4	3	4	4	180
MN93434	61.1	31.3	67	1	64	14.5	1.80	14.5	61.7	11.9	0.32	59.3	3	59.3	4.25	3	3	3	3	5	5	198
SBF0402	60.3	34.6	80	1	58	14.6	1.73	14.6	65.0	13.6	0.31	61.1	5	59.3	5.00	3	4	3	5	3	5	203
ND691	58.2	27.1	40	2	67	13.9	1.69	13.9	64.5	13.1	0.32	59.3	3	59.3	4.50	3	3	3	5	3	5	193
ND692	62.0	29.0	54	2	62	13.8	1.73	13.8	64.8	12.9	0.28	56.9	3	56.9	5.00	3	3	3	5	3	5	200
ND694	62.2	30.9	67	0	63	15.1	1.72	15.1	65.7	14.7	0.38	59.3	3	59.3	4.00	3	3	4	5	3	4	202
ND695	60.4	43.3	67	2	53	14.1	1.71	14.1	61.7	13.9	0.38	57.3	2	57.3	4.00	3	4	3	5	3	4	198

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USDA / ARS
WHEAT QUALITY LAB

Table 22 (cont.)

FARGO, ND																			
LOCATION: Carrington, ND																			
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	C C	C G	C T	LOAF VOL (cc)
						PRO (14% mb)	ASH		PRO (14 % mb)	ASH									
-----Rating-----																			
GUNNAR	61.9	28.6	65	2	68	15.1	1.82	62.0	14.8	0.44	59.6	3	59.6	3.75	3	3	3	5	200
N92-0248	60.6	28.2	57	0	57	13.3	1.71	66.5	12.4	0.38	56.9	2	56.9	2.75	2	3	3	4	180
N92-0434	59.9	33.1	80	0	52	14.2	1.71	61.9	13.7	0.41	59.6	3	59.6	4.00	3	3	4	4	202
N92-0126	59.2	31.4	75	1	58	14.3	1.81	60.7	13.9	0.41	57.9	2	55.9	3.50	3	3	5	5	204
N92-0176	61.0	36.2	85	0	63	13.8	1.77	63.4	13.2	0.38	60.0	3	60.0	3.25	3	4	3	5	211
MT9311	60.1	27.9	35	3	38	13.1	1.70	54.2	12.4	0.39	56.5	2	58.5	3.75	3	3	3	5	203
MT9410	61.8	34.1	80	0	71	13.6	1.65	61.4	12.8	0.34	58.6	3	60.9	4.00	3	3	3	5	203
MT9433	60.7	34.0	80	1	81	14.7	1.75	64.5	13.8	0.39	60.8	3	60.8	3.00	3	3	3	6	210
T1105	58.3	27.5	28	8	70	13.7	1.79	58.9	12.8	0.41	57.3	2	59.1	3.50	3	4	3	5	203
T801.93	61.4	38.0	81	1	59	13.3	1.90	57.2	12.2	0.44	59.3	5	59.3	6.00	3	3	2	6	202
SDM50005	60.4	34.2	74	1	49	13.8	1.80	58.8	13.4	0.37	54.6	2	54.6	3.00	2	3	5	5	187
FA 994-601	62.5	32.7	76	0	50	13.9	1.80	58.9	13.5	0.39	59.6	3	57.7	3.00	3	3	5	6	186
BW191	58.6	31.6	67	1	56	15.1	1.91	59.1	14.8	0.44	59.6	3	59.6	4.50	3	3	3	5	208
9023-FM04C	59.4	31.3	57	3	40	12.5	1.72	56.1	11.7	0.43	55.5	2	53.5	3.00	2	4	3	5	178

RATINGS:		0						3		6	
		STICKY-WEAK		PLIABLE		ELASTIC		CREAMY		BUCKY	
		YELLOW		GREY		DULL		OPEN, THICK		BRIGHT WHITE	
		IRREG, THICK		HARSH		COARSE				FINE SILKY	
DOUGH CHIAI (DC):		CRUMB COLOR (CC):		CRUMB GRAIN (CG):		CRUMB TEXTURE (CT):					

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 23

LOCATION: Crookston, MN														FARGO, ND									
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	Rating					LOAF VOL (cc)		
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)						C	C	C	G	T			
Marquis	51.4	16.5	11	27	54	12.6	2.04	53.3	11.4	0.49	56.2	3	58.5	4.50	2	4	5	4		178			
Chris	57.7	24.3	54	7	75	15.2	1.80	63.8	14.9	0.39	60.8	4	60.8	3.25	3	3	3	5		207			
Era	58.0	23.1	45	8	66	13.8	1.81	64.3	12.9	0.41	61.1	4	61.1	3.75	3	3	3	5		210			
Stoa	59.0	29.3	64	0	73	15.5	1.87	63.8	15.0	0.38	65.4	4	65.4	3.75	3	3	4	6		210			
Butte 86	60.3	31.7	70	3	79	15.3	1.76	62.8	14.2	0.35	65.1	4	65.1	3.00	3	5	3	6		209			
SD8089	59.6	27.4	58	8	67	13.6	1.66	64.3	12.1	0.41	59.6	3	59.6	3.50	2	3	6	4		195			
SD3219	63.5	33.3	74	3	84	14.4	1.69	65.3	13.3	0.37	59.6	3	59.6	4.00	2	3	5	5		205			
SD3236	62.6	32.5	66	3	82	14.1	1.72	60.6	12.3	0.33	59.6	4	59.6	4.00	3	5	3	5		192			
SD3249	64.1	31.8	72	2	71	14.5	1.71	63.2	13.4	0.41	61.4	4	61.4	3.75	3	4	3	5		192			
SD8108	62.6	33.8	77	2	58	13.5	1.61	60.8	12.0	0.40	57.6	4	57.6	5.00	3	3	5	5		176			
SBE0050	59.6	29.3	49	6	64	13.5	1.74	59.0	12.3	0.53	59.6	4	59.6	5.00	3	3	4	4		202			
MN91309	61.7	35.6	68	3	67	13.9	1.63	64.2	13.1	0.46	60.5	4	60.5	4.25	3	3	5	5		193			
MN91227	57.7	27.7	65	5	51	13.8	1.83	57.3	12.8	0.51	56.2	2	56.2	3.25	2	4	5	4		189			
MN93413	57.4	30.8	57	5	71	11.7	1.73	61.8	10.3	0.46	57.3	3	57.3	3.75	2	3	4	4		173			
MN93434	60.9	32.5	72	3	77	14.2	1.70	62.3	12.8	0.42	61.1	4	61.1	3.50	3	5	3	6		201			
SBF0402	59.9	31.7	72	2	71	15.4	1.64	61.2	14.1	0.39	60.8	4	60.8	4.50	3	3	3	6		202			
ND691	58.1	26.0	47	2	79	13.4	1.70	60.1	12.1	0.46	58.2	3	58.2	5.00	3	4	5	6		200			
ND692	58.8	25.8	48	4	77	15.5	1.86	63.2	14.5	0.43	61.4	4	61.4	3.75	3	4	3	6		211			
ND694	62.0	31.2	77	1	72	15.5	1.68	65.3	14.3	0.41	61.1	4	61.1	3.50	3	6	3	6		203			
ND695	59.7	27.7	67	4	65	15.4	1.67	62.4	14.5	0.38	60.0	4	60.0	3.50	3	4	3	5		210			

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 23 (cont.)

FARGO, ND

LOCATION: Crookston, MN

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	-----Rating-----						LOAF VOL (cc)										
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	FLOUR							ABS	PRO	ASH (14 % mb)	C	C	C		T									
									FLOUR	EXT (%)														PRO	ASH (14 % mb)	ABS	PRO	ASH (14 % mb)	C	C	C	T
GUNNAR	60.1	25.4	47	7	76	15.9	1.92	65.4	15.3	0.44	62.5	4	62.5	3.50	3	4	5	4	224													
N92-0248	59.0	25.6	45	4	60	13.6	1.70	64.9	12.6	0.37	55.0	2	55.0	3.75	2	5	5	4	190													
N92-0434	56.2	30.4	62	4	62	15.0	1.86	58.0	14.2	0.41	60.3	4	60.3	4.25	3	4	3	5	220													
N92-0126	56.6	28.2	73	2	67	15.4	1.90	62.9	14.8	0.40	61.4	4	61.4	3.50	3	5	3	6	216													
N92-0176	59.1	32.8	72	3	66	14.4	1.80	62.4	13.3	0.33	60.0	4	60.0	3.25	3	3	3	5	217													
MT9311	56.2	23.9	30	12	43	13.6	1.66	53.4	12.8	0.38	61.1	3	61.1	3.00	2	3	4	4	193													
MT9410	60.3	33.6	73	3	67	14.1	1.73	60.8	12.2	0.45	60.8	3	60.8	3.50	2	3	3	5	200													
MT9433	57.2	27.2	36	11	86	14.9	1.84	59.2	13.5	0.52	62.5	4	62.5	3.75	3	3	3	5	216													
T1105	58.2	24.8	30	14	84	13.8	1.71	58.2	12.4	0.48	58.6	4	58.6	4.75	3	4	3	6	203													
T801.93	53.7	26.0	30	11	70	15.4	2.12	50.7	13.9	0.60	64.7	5	64.7	5.00	3	4	3	6	245													
SDM50005	56.6	27.8	50	7	49	14.9	1.84	60.7	14.1	0.42	60.0	3	60.0	3.00	2	4	3	5	186													
FA 994-501	64.1	33.7	78	2	66	14.0	1.59	62.9	13.5	0.34	59.3	3	59.3	2.75	2	5	3	6	196													
BW191	61.0	32.6	78	2	73	15.8	1.76	63.6	14.8	0.42	64.7	4	64.7	3.00	3	3	3	6	220													
9023-FM04C	52.2	27.2	20	17	34	12.3	1.85	55.7	11.3	0.48	56.2	2	56.2	3.00	1	1	3	1	179													

		0			3			6		
		STICKY-WEAK	PLIABLE	ELASTIC				BUCKY		
		YELLOW	GREY	DULL				CREAMY	BRIGHT WHITE	
		IRREG, THICK				OPEN, THICK			FINE	
		HARSH				COARSE			SILKY	
RATINGS:		DOUGH CHAR (DC):								
		CRUMB COLOR (CC):								
		CRUMB GRAIN (CG):								
		CRUMB TEXTURE (CT):								

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 24

LOCATION: <i>Langdon,ND</i>														FARGO,ND									
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR		FLOUR		MIX		BAKE ABS	MIX TIME (min)	D C	Rating-----				LOAF VOL (cc)		
						PRO	ASH (14% mb)	EXT	(%)	PRO	ASH (14 % mb)	ABS	PAT				C	C	G	T			
Marquis	57.0	26.0	61	2	62	15.9	1.80	58.6	15.0	0.40	60.3	3	58.9	3.00	2	4	3	5	5	192			
Chris	58.2	25.6	50	4	71	15.2	1.71	59.0	14.9	0.34	61.1	3	61.1	3.00	3	4	5	5	5	203			
Era	55.9	23.9	29	8	67	14.0	1.80	61.7	13.2	0.41	59.6	2	57.4	3.50	2	1	3	5	5	215			
Stoa	54.2	26.8	48	4	64	15.7	1.92	56.0	15.0	0.41	61.1	4	59.3	3.50	3	4	5	5	5	188			
Butte 86	56.6	27.0	45	3	66	14.6	1.71	57.9	13.6	0.37	60.0	3	60.2	3.50	2	4	5	5	5	186			
SD8089	54.4	23.5	22	12	52	14.9	1.86	55.1	14.5	0.41	59.6	3	58.5	4.00	3	4	3	5	5	207			
SD3219	58.5	25.2	27	7	70	14.6	1.85	53.9	13.5	0.40	58.2	3	58.2	6.00	3	4	3	5	5	198			
SD3236	60.3	29.1	48	3	73	14.3	1.64	50.7	13.7	0.34	60.3	4	60.3	5.00	3	3	3	6	6	193			
SD3249	60.3	26.0	41	5	66	14.8	1.67	46.0	14.3	0.37	60.0	3	60.4	5.25	3	4	3	6	6	210			
SD8180	59.2	29.2	55	3	58	14.3	1.83	41.5	13.9	0.37	58.2	3	59.7	5.00	3	3	3	6	6	193			
SBE0050	58.2	27.5	42	5	69	14.2	1.73	36.8	13.9	0.44	61.4	4	61.4	4.00	3	4	5	5	5	202			
MN91309	57.1	28.0	32	5	63	14.3	1.71	38.9	14.1	0.39	61.8	5	61.8	4.75	3	4	5	5	5	202			
MN91227	57.6	27.9	51	4	52	13.9	1.85	57.1	13.4	0.34	54.6	1	54.6	3.25	1	1	3	4	4	175			
MN93413	57.8	32.4	62	2	74	13.7	1.69	61.4	12.7	0.43	59.6	2	57.5	3.25	2	4	6	5	5	189			
MN93434	57.8	27.6	47	3	71	14.7	1.80	58.3	14.0	0.42	59.0	3	57.3	4.25	2	3	6	6	6	187			
SBF0402	57.8	26.7	51	5	62	15.1	1.81	59.2	14.4	0.41	58.6	3	56.8	5.50	3	4	5	6	6	201			
ND691	57.6	24.4	30	6	71	14.5	1.71	58.8	13.6	0.42	60.8	3	58.6	4.00	2	1	3	6	6	191			
ND692	58.6	26.7	43	4	75	14.4	1.77	59.9	13.9	0.38	57.9	2	59.9	4.00	2	3	3	6	6	193			
ND694	60.1	29.6	63	2	72	15.1	1.68	58.7	14.5	0.37	60.0	2	62.5	4.00	3	4	3	6	6	227			
ND695	58.2	27.2	51	4	72	15.3	1.82	58.1	14.7	0.36	60.0	2	60.0	3.25	2	4	5	6	6	203			

**USDA / ARS
WHEAT QUALITY LAB**

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	HARD- NESS	NIR
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FLOUR	PRO	ASH	(14 % mb)
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FARGO, ND

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RATINGS:			
DOUGH CHAR (DC):	STICKY-WEAK	PLIABLE	ELASTIC
CRUMB COLOR (CC):	YELLOW	GREY	CREAMY
CRUMB GRAIN (CG):	IRREG, THICK		OPEN, THICK
CRUMB TEXTURE (CT):	HARSH		COARSE
			BUCKY
			BRIGHT WHITE
			FINE
			SILKY

DOUGH CHAR (DC):
CRUMB COLOR (CC):
CRUMB GRAIN (CG):
CRUMB TEXTURE (C

3

6

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 25

LOCATION: <i>Minot, ND</i>													FARGO, ND												
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----					LOAF VOL (cc)		
					HAARD- NESS	PRO	ASH (14%mb)	EXT (%)	PRO	ASH (14 % mb)	C	C						C	G	T					
Marquis	59.0	27.7	63	3	60	14.2	1.60	54.8	13.4	0.38	57.6	3		57.6	4.00	2	4	3	4		168				
Chris	60.1	27.5	62	2	73	15.0	1.66	59.9	14.7	0.37	59.6	4		62.2	4.00	3	3	2	5		177				
Era	60.2	30.6	70	1	71	13.5	1.57	60.8	12.6	0.41	60.5	3		60.5	4.50	3	3	5	6		180				
Stoa	58.0	34.7	84	0	78	15.3	1.79	59.7	14.8	0.40	62.7	3		62.7	3.50	3	4	5	6		192				
Butte 86	61.2	37.2	89	0	81	15.8	1.80	61.3	14.8	0.39	60.8	3		60.8	2.75	2	4	3	5		184				
SD8089	60.2	31.2	63	2	72	14.7	1.66	61.9	13.9	0.40	59.3	2		59.3	3.50	3	4	2	4		190				
SD3219	63.6	32.4	72	1	75	14.6	1.61	61.3	13.5	0.36	59.0	2		59.0	5.00	2	1	3	5		175				
SD3236	61.0	32.4	67	1	80	15.8	1.69	53.0	14.2	0.43	59.0	2		59.6	3.50	3	3	3	5		186				
SD3249	62.6	32.6	77	1	71	15.9	1.63	57.9	15.5	0.34	60.0	3		60.4	3.50	3	3	3	6		194				
SD8108	62.2	34.8	78	1	59	14.9	1.66	50.9	14.2	0.34	61.1	4		61.1	4.50	3	3	5	6		183				
SBE0050	61.4	32.5	63	2	63	15.2	1.66	54.0	14.5	0.35	61.1	4		61.1	5.00	3	4	3	6		186				
MN91309	61.2	36.2	71	1	75	15.8	1.67	58.8	15.0	0.32	62.7	3		60.9	4.00	3	5	3	5		180				
MN91227	61.1	33.8	83	0	54	13.9	1.62	55.3	13.4	0.37	57.6	2		55.4	3.00	2	3	4	5		183				
MN93413	59.4	33.7	62	2	73	12.8	1.46	56.0	11.5	0.35	59.0	3		59.0	4.50	2	4	4	4		171				
MN93434	61.9	34.5	77	1	76	15.5	1.56	56.5	14.4	0.31	58.6	3		58.6	4.50	2	3	5	4		172				
SBF0402	61.0	37.7	89	0	69	16.4	1.78	54.9	15.5	0.38	61.8	3		59.8	4.25	3	3	2	6		189				
ND691	59.8	31.0	70	1	79	14.7	1.56	57.6	14.0	0.39	61.4	3		59.4	4.50	3	3	3	6		182				
ND692	61.4	31.2	71	1	76	15.0	1.74	60.4	14.2	0.39	60.3	4		61.7	4.50	3	3	3	6		196				
ND694	61.4	30.6	73	1	75	16.1	1.68	59.2	15.6	0.38	62.1	4		62.1	3.75	3	5	3	6		193				
ND695	61.0	33.1	82	1	71	15.4	1.70	56.5	14.7	0.32	60.3	3		60.3	3.25	3	4	3	6		200				

1996 Spring Uniform Regional Nursery

**USDA / ARS
WHEAT QUALITY LAB**

Table 25 (cont.)

LOCATION: <i>Minot, ND</i>										FARGO, ND											
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	C C	C G	C T	LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)											
GUNNAR	60.5	30.1	74	1	87	16.9	1.70	62.1	16.5	0.44	63.4	3	65.5	3.25	3	4	2	6	201		
N92-0248	60.1	29.9	70	2	66	15.0	1.70	59.5	13.9	0.37	57.9	2	59.9	2.50	2	4	4	4	186		
N92-0434	60.3	37.2	87	1	64	15.5	1.68	55.1	14.9	0.42	63.7	3	61.4	3.50	3	3	3	5	198		
N92-0126	58.0	33.6	85	1	68	15.2	1.82	57.1	14.5	0.43	64.0	3	61.9	3.00	3	3	3	6	210		
N92-0176	61.4	36.5	86	0	75	15.7	1.76	63.0	14.8	0.41	63.7	4	61.5	3.50	3	4	3	6	201		
MT9311	60.6	34.0	68	2	50	13.9	1.55	49.1	13.7	0.42	60.0	3	58.3	3.50	3	3	3	5	192		
MT9410	62.4	35.5	80	1	85	14.9	1.68	60.2	14.1	0.40	61.4	3	59.7	4.00	3	5	3	5	198		
MT9433	60.6	35.2	77	1	87	15.6	1.65	59.2	14.8	0.41	61.4	3	61.4	3.50	3	3	3	5	196		
T1105	60.5	31.2	60	2	74	14.5	1.68	53.5	13.3	0.41	57.6	2	55.5	4.50	2	3	3	5	195		
T801.93	60.6	45.0	87	1	77	14.9	1.82	55.8	13.8	0.53	64.0	5	62.2	5.50	3	3	3	6	210		
SDM50005	60.5	34.4	83	1	60	14.8	1.66	61.6	14.5	0.42	59.0	2	59.0	3.25	2	4	5	6	197		
FA 994-601	62.0	35.7	86	0	69	16.5	1.78	62.8	15.9	0.31	61.8	3	59.9	2.50	3	2	2	6	197		
BW191	60.2	31.1	68	1	69	17.2	1.91	59.7	16.7	0.33	64.0	4	62.3	3.25	3	1	3	6	206		
9023-FM04C	60.3	36.2	71	1	46	13.5	1.65	56.9	12.7	0.43	57.9	2	55.8	3.25	2	4	3	4	174		

	0	3	6
RATINGS:			
DOUGH CHAR (DC):	STICKY-WEAK	PLIABLE	ELASTIC
CRUMB COLOR (CC):	YELLOW	GREY	CREAMY
CRUMB GRAIN (CG):	IRREG, THICK		BRIGHT WHITE
CRUMB TEXTURE (CT):	HARSH	OPEN, THICK	FINE
		COARSE	SILKY

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 26

LOCATION: Prosper,ND										FARGO,ND												
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	-----Rating-----				LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14%mb)	EXT (%)	PRO	ASH (14 % mb)	C	C						G	T			
Marquis	47.8	16.6	12	20	47	12.3	1.89	1.89	50.5	11.5	0.59	53.8	2	57.9	4.50	2	3	2	4	4	170	
Chris	57.7	26.2	61	3	71	15.2	1.66	1.66	60.1	14.1	0.40	57.9	2	61.8	3.25	3	3	5	6	6	197	
Era	57.2	28.3	64	3	68	13.4	1.74	1.74	63.7	12.7	0.46	55.8	2	58.5	3.75	2	3	3	5	5	190	
Stoa	57.0	32.7	74	2	75	15.2	1.78	1.78	64.1	13.7	0.38	58.2	3	60.3	3.50	2	3	3	5	5	205	
Butte 86	59.2	31.5	74	1	82	14.7	1.62	1.62	63.5	13.8	0.37	59.3	3	59.3	3.50	2	3	5	6	6	210	
SD8089	56.8	27.4	46	6	75	14.9	1.67	1.67	62.8	13.8	0.40	57.6	2	57.6	5.00	2	3	3	5	5	196	
SD3219	61.6	31.8	71	2	76	14.0	1.61	1.61	63.4	12.5	0.37	54.3	2	56.2	5.00	2	3	5	4	4	180	
SD3236	59.9	33.7	73	1	73	14.7	1.69	1.69	57.7	12.9	0.36	55.8	3	57.9	4.75	2	5	4	5	5	184	
SD3249	61.8	31.0	68	2	70	15.0	1.64	1.64	58.9	14.0	0.35	57.3	3	57.3	4.75	3	3	3	4	4	174	
SD8108	60.9	32.5	79	2	59	14.2	1.70	1.70	54.6	12.8	0.32	55.0	3	55.0	6.00	3	3	3	5	5	175	
SBE0050	59.2	29.4	49	5	59	13.6	1.70	1.70	54.0	12.7	0.43	56.5	3	58.5	6.00	2	3	3	4	4	193	
MN91309	58.0	32.4	64	2	66	13.9	1.60	1.60	59.8	12.7	0.39	57.3	3	57.3	4.75	2	5	3	5	5	170	
MN91227	59.1	34.6	79	2	56	13.7	1.77	1.77	57.0	12.3	0.46	52.2	2	54.4	3.50	1	3	3	4	4	169	
MN93413	57.4	35.1	80	1	74	12.8	1.70	1.70	61.2	11.2	0.55	56.5	2	58.2	4.00	2	3	3	4	4	164	
MN93434	59.8	33.6	77	1	74	14.1	1.61	1.61	59.5	12.7	0.41	55.0	2	55.0	5.00	2	5	4	4	4	181	
SBF0402	59.4	33.0	76	2	71	15.6	1.61	1.61	58.8	14.1	0.37	56.5	3	56.5	5.50	3	4	3	5	5	194	
ND691	53.5	21.0	10	15	64	14.7	1.83	1.83	52.8	14.4	0.36	60.0	5	60.0	6.00	2	4	3	6	6	192	
ND692	60.1	24.6	38	6	70	15.0	1.81	1.81	60.2	14.0	0.37	56.5	4	56.5	5.00	3	3	4	6	6	197	
ND694	61.6	30.1	68	1	78	14.8	1.56	1.56	63.0	13.8	0.34	57.3	3	57.3	4.25	3	3	3	5	5	195	
ND695	58.7	27.5	60	2	63	15.0	1.72	1.72	57.7	13.7	0.36	57.3	2	57.3	3.25	3	3	3	6	6	195	

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USDA / ARS
WHEAT QUALITY LAB

Table 26 (cont.)

LOCATION: Prosper, ND										FARGO, ND														
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR		FLOUR EXT (%)	FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	Rating-----						LOAF VOL (cc)
						PRO	ASH (14% mb)	PRO	ASH (14% mb)		C	C						C	G	T				
GUNNAR	58.3	25.1	36	5	72	15.4	1.87	56.2	14.4	0.41	57.9	3	57.9	4.25	3	2	3	6	202					
N92-0248	56.8	24.6	45	4	57	13.6	1.64	57.5	12.4	0.38	55.3	2	55.3	3.00	2	3	3	6	182					
N92-0434	57.0	30.1	66	2	67	14.3	1.75	56.7	12.8	0.43	58.6	3	58.6	4.50	3	4	4	6	201					
N92-0126	55.5	29.2	70	2	61	14.4	1.80	58.9	13.5	0.40	59.0	3	59.0	3.75	3	3	5	6	200					
N92-0176	58.7	32.3	81	1	78	13.3	1.63	62.5	12.5	0.37	57.3	2	57.3	4.00	2	3	3	6	198					
MT9311	58.1	25.4	41	5	53	13.6	1.71	46.7	13.1	0.41	57.3	2	57.3	4.00	3	5	3	5	203					
MT9410	61.1	34.2	74	5	92	13.9	1.65	57.7	12.2	0.36	57.6	2	57.6	4.50	2	5	3	4	200					
MT9433	59.5	28.9	53	5	95	15.1	1.80	60.3	13.5	0.40	60.8	3	60.8	3.50	3	4	3	6	204					
T1105	56.8	22.6	10	18	88	14.4	1.81	53.7	13.2	0.43	59.0	4	59.0	4.50	3	4	3	6	208					
T801.93	57.0	31.6	61	4	77	13.7	1.80	56.1	12.3	0.50	60.5	4	60.5	6.25	3	3	3	5	208					
SDM50005	58.3	28.7	64	3	66	13.6	1.85	58.0	13.2	0.38	60.0	2	60.0	3.50	2	3	3	5	185					
FA 994-601	63.5	33.6	80	1	75	14.1	1.54	59.5	13.1	0.29	56.2	2	56.2	3.50	2	4	3	6	186					
BW191	58.8	35.5	88	0	79	15.7	1.76	59.4	14.8	0.35	60.3	4	60.3	3.50	3	4	3	6	213					
9023-FM04C	53.1	24.7	7	12	49	12.3	1.68	47.4	11.6	0.40	55.3	2	55.3	4.50	2	1	3	4	177					

RATINGS:				0		3	
DOUGH CHAR (DC):		STICKY-WEAK		PLIABLE		ELASTIC	
CRUMB COLOR (CC):		YELLOW		GREY		DULL	
CRUMB GRAIN (CG):		IRREG, THICK		CREAMY		OPEN, THICK	
CRUMB TEXTURE (CT):		HARSH		COARSE		F	

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USDA / ARS
WHEAT QUALITY LAB

Table 27

LOCATION: <i>Brookings, SD</i>														FARGO, ND									
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating				LOAF VOL (cc)	
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	ABS	C						C	G	T			
Marquis	60.6	29.1	77	1	71	11.7	1.60	61.0	10.1	0.40	51.9	2	61.9	5.00	2	4	3	5	5	158			
Chris	61.8	30.0	76	1	75	12.2	1.55	59.6	10.9	0.36	52.2	2	62.5	4.25	2	3	3	5	5	162			
Era	60.9	29.9	66	2	73	11.0	1.55	61.3	9.5	0.42	55.0	2	63.0	4.25	2	3	5	5	5	168			
Stoa	61.4	32.2	72	2	70	11.5	1.49	62.4	10.3	0.36	56.2	2	60.4	4.50	2	3	2	6	6	155			
Butte 86	63.2	37.0	92	1	82	11.9	1.62	61.3	10.2	0.35	56.9	2	60.6	3.50	2	4	5	5	5	147			
SD8089	61.3	33.2	77	1	75	10.4	1.41	65.4	8.7	0.39	53.3	2	59.3	4.50	1	3	5	4	4	150			
SD3219	63.4	35.8	89	0	63	10.3	1.44	63.2	8.6	0.36	50.5	2	60.2	6.00	2	4	3	4	4	142			
SD3236	62.6	35.7	81	2	81	12.0	1.59	54.9	10.0	0.34	55.3	2	61.0	4.50	1	5	6	4	4	147			
SD3249	64.4	34.5	88	0	70	12.3	1.59	53.5	10.9	0.36	55.3	2	59.2	4.50	1	4	3	5	5	146			
SD8108	63.6	34.5	80	1	63	11.2	1.51	59.8	10.0	0.33	51.3	2	59.3	8.50	1	4	5	4	4	145			
SBE0050	61.8	33.3	69	3	58	10.9	1.48	57.1	9.8	0.39	52.2	2	58.5	7.50	2	3	3	4	4	152			
MN91309	62.2	36.8	78	2	76	11.8	1.46	64.8	10.4	0.37	57.9	3	61.9	5.25	2	3	3	5	5	162			
MN91227	61.8	33.3	80	1	51	11.1	1.62	56.9	10.0	0.40	50.2	1	58.5	5.00	1	4	3	4	4	146			
MN93413	60.0	36.5	77	1	71	10.0	1.38	60.4	8.4	0.42	50.8	2	58.7	5.00	2	4	3	4	4	150			
MN93434	63.1	38.3	88	1	69	12.0	1.47	61.0	10.5	0.39	52.9	2	56.8	5.50	2	3	5	5	5	148			
SBF0402	62.0	36.2	84	1	60	11.9	1.59	58.7	10.7	0.36	53.2	3	57.3	7.50	2	5	5	4	4	157			
ND691	61.2	28.3	87	1	72	10.7	1.55	57.3	9.2	0.38	51.9	2	61.9	7.25	2	3	3	5	5	151			
ND692	62.7	30.2	66	2	68	11.1	1.55	58.7	9.3	0.38	52.2	3	62.5	6.50	2	3	3	5	5	152			
ND694	62.9	34.2	86	1	77	12.0	1.57	57.9	10.7	0.38	55.0	3	65.3	5.25	3	5	3	6	6	170			
ND695	63.4	35.2	82	1	61	11.5	1.54	54.7	10.3	0.36	55.3	2	59.1	5.00	2	3	3	6	6	163			

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 27 (cont.)

FARGO, ND

LOCATION: *Brookings, SD*

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	Rating-----						LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	FLOUR EXT (%)	PRO	ASH (14 % mb)						C	C	C	G	T		
GUNNAR	63.3	32.2	82	1	82	12.2	1.74	59.7	10.7	0.44	53.8	2	69.1	4.50	2	3	3	6	157			
N92-0248	59.5	27.8	62	2	54	11.1	1.65	54.5	10.0	0.40	50.8	1	56.8	4.25	2	3	3	4	157			
N92-0434	61.3	36.5	80	2	59	11.1	1.50	57.1	9.8	0.40	53.5	2	59.6	5.25	2	4	5	4	169			
N92-0126	59.8	35.6	86	1	53	11.9	1.68	56.1	10.9	0.38	52.6	2	58.7	4.50	2	5	5	5	170			
N92-0176	62.5	35.5	88	0	66	11.3	1.65	60.7	9.9	0.38	55.0	3	59.3	6.00	2	6	5	5	162			
MT9311	61.1	29.7	64	3	40	11.7	1.48	46.7	10.9	0.40	55.5	2	61.6	4.00	2	3	5	5	180			
MT9410	63.1	38.8	87	2	87	11.7	1.47	59.4	10.2	0.38	55.0	3	59.2	6.00	2	6	3	5	163			
MT9433	62.2	35.2	84	1	86	11.4	1.57	60.3	9.6	0.44	53.2	2	61.0	4.50	2	6	3	6	172			
T1105	60.4	28.2	46	8	75	11.5	1.56	53.8	9.9	0.44	52.6	3	60.8	5.00	2	4	6	6	174			
T801.93	61.9	39.7	82	1	79	11.6	1.69	53.3	9.8	0.47	54.6	3	58.6	9.00	2	3	5	4	161			
SDM50005	61.0	33.4	79	1	58	11.4	1.57	54.7	10.3	0.39	53.2	3	59.3	4.25	2	3	3	5	177			
FA 994-601	64.8	36.1	89	1	66	11.5	1.42	59.2	10.3	0.33	55.5	3	59.6	4.00	2	6	3	5	169			
BW191	61.0	35.7	87	1	71	13.3	1.58	60.5	12.2	0.43	56.9	3	60.7	4.50	3	6	3	6	192			
9023-FM04C	58.6	30.4	53	4	42	11.0	1.58	54.5	10.0	0.41	49.9	2	58.1	4.50	2	1	3	4	172			

RATINGS:		0						3			6		
		STICKY-WEAK		PLIABLE		ELASTIC		GREY		CREAMY		BUCKY	
		YELLOW		IRREG, THICK		DULL		OPEN, THICK		COARSE		BRIGHT WHITE	
		HARSH		CRUMB TEXTURE (CT):		CRUMB COLOR (CC):		CRUMB GRAIN (CG):		FINE		SILKY	

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 28

LOCATION: Groton, SD										FARGO, ND														
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	-----Rating-----						LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	C	C						C	G	T				
Marquis	60.2	27.2	60	3	80	14.7	1.75	63.2	13.0	0.44	55.3	2	59.1	3.00	2	3	3	3	3	5	180			
Chris	60.2	27.0	63	2	80	15.6	1.75	62.7	14.9	0.42	56.5	2	60.3	2.50	3	3	3	4	6	195				
Era	61.0	28.5	57	4	78	14.0	1.77	64.9	12.3	0.43	53.8	2	59.9	4.00	2	3	2	4	181					
Stoa	59.4	27.8	59	2	75	14.4	1.84	64.5	13.1	0.40	56.9	3	60.6	4.00	2	3	6	6	202					
Butte 86	60.2	32.5	70	4	85	14.2	1.83	64.0	12.4	0.43	56.9	2	60.6	2.75	1	3	6	6	188					
SD8089	59.7	28.5	57	6	78	13.8	1.75	64.8	11.9	0.44	54.3	2	58.4	3.00	2	4	5	4	187					
SD3219	62.9	32.9	68	4	81	12.8	1.67	62.3	10.9	0.44	53.2	2	57.3	4.00	2	4	3	4	184					
SD3236	61.6	31.3	60	4	90	14.3	1.73	57.3	12.2	0.40	55.3	2	61.1	4.00	2	3	3	5	179					
SD3249	62.6	30.8	57	6	81	14.7	1.71	60.7	13.6	0.38	56.5	3	60.2	4.25	3	3	3	6	192					
SD8108	61.8	31.2	68	2	73	14.0	1.76	59.0	12.3	0.31	55.3	3	59.2	4.25	3	3	2	5	197					
SBE0050	61.7	30.1	56	3	79	13.6	1.79	61.1	12.2	0.41	56.5	3	60.2	4.50	2	4	3	5	187					
MN91309	60.6	32.7	58	5	87	14.2	1.80	61.9	12.6	0.44	56.5	3	60.2	4.00	3	3	3	5	191					
MN91227	61.1	33.4	56	2	77	13.7	1.74	58.5	12.4	0.43	53.8	1	57.9	2.75	2	4	5	4	173					
MN93413	60.1	34.6	72	3	92	13.2	1.67	61.4	11.4	0.45	59.6	3	59.6	2.75	2	4	3	6	186					
MN93434	61.8	33.2	75	1	80	14.7	1.83	61.4	13.1	0.43	56.9	3	60.8	4.00	3	4	5	6	196					
SBF0402	60.8	31.8	70	2	74	14.9	1.75	60.6	13.4	0.40	57.3	3	61.2	4.50	3	4	4	6	201					
ND691	61.1	29.9	59	3	87	14.0	1.65	61.8	12.5	0.40	57.3	3	61.0	4.00	2	3	5	6	192					
ND692	62.2	29.4	65	3	89	13.9	1.71	63.7	12.1	0.36	56.2	3	60.4	4.00	2	4	6	6	200					
ND694	62.2	31.8	71	2	86	15.1	1.77	61.3	13.3	0.37	57.6	3	61.6	3.75	3	5	3	6	210					
ND695	61.4	31.5	70	4	79	14.0	1.73	60.3	12.1	0.37	56.5	2	60.3	3.00	2	4	5	6	195					

**USDA / ARS
WHEAT QUALITY LAB**

FARGO, ND

[illegible]

GUNNAR	63.0	31.4	73	2	92	15.3	1.81	61.9	13.9	0.41	57.3	2	61.4	2.50	2	3	2	6	191
N92-0248	61.0	27.4	62	4	74	13.7	1.70	62.4	12.0	0.34	53.8	2	57.9	2.50	2	3	4	5	181
N92-0434	60.9	36.8	79	2	79	14.4	1.70	59.0	13.0	0.38	57.3	2	61.4	3.25	2	3	4	6	203
N92-0126	58.5	33.3	77	2	79	14.4	1.92	60.4	13.6	0.40	57.3	2	61.4	3.00	2	5	5	5	205
N92-0176	61.4	34.8	78	2	85	13.5	1.73	63.2	11.9	0.40	55.8	2	60.0	3.00	2	5	3	5	200
MT9311	61.4	31.2	67	3	64	14.2	1.65	56.1	13.3	0.36	57.3	2	61.1	3.25	2	6	3	5	203
MT9410	62.1	35.1	67	3	100	14.3	1.72	61.5	12.9	0.37	57.6	2	61.5	3.25	3	5	5	5	201
MT9433	60.8	34.7	75	4	103	14.4	1.76	60.8	12.3	0.41	56.9	2	60.6	3.00	3	3	3	5	197
T1104	60.7	30.1	48	8	94	13.9	1.79	59.7	12.4	0.38	55.3	2	59.3	4.00	2	3	3	6	195
T801.93	61.9	36.8	75	4	86	14.2	1.93	58.0	12.6	0.53	59.3	3	63.2	5.00	2	3	3	6	215
SDM50005	60.6	34.2	70	4	78	14.6	1.86	62.7	13.8	0.37	57.3	2	61.0	2.50	2	3	6	5	185
FA 994-601	62.7	31.8	72	4	82	14.0	1.86	62.1	12.7	0.35	56.9	2	60.9	3.00	2	5	3	6	200
BW191	59.0	32.5	67	3	86	15.8	2.01	61.5	14.6	0.41	58.6	3	62.6	3.00	3	4	3	6	227
9023-FM04C	60.4	34.2	67	3	60	12.6	1.78	61.3	10.8	0.38	53.2	2	61.1	3.00	1	4	1	4	167

DOUGH CHAR (DC):

CRUMB COLOR (CC):	YELLOW	GREY	DULL	CREAMY	BRIGHT WHITE
CRUMB GRAIN (CG):	IRREG, THICK		OPEN, THICK		FINE
CRUMB TEXTURE (CT):	HAIRY		COARSE		SILKY

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 29

LOCATION: Selby, SD										FARGO, ND										
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX		BAKE ABS	MIX TIME (min)	D C	Rating-----				LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	ABS	PAT				C	C	C	T	
Marquis	61.5	27.8	69	1	89	11.9	1.50	61.9	10.5	0.35	49.9	1	56.1	5.25	1	1	3	1	160	
Chris	62.6	26.8	57	1	83	12.2	1.50	60.9	11.3	0.35	52.6	2	62.8	4.25	2	3	2	4	165	
Era	62.6	28.7	59	3	87	11.1	1.51	61.1	9.6	0.38	54.6	2	60.7	4.00	2	3	3	4	172	
Stoa	62.4	30.0	62	2	81	11.8	1.50	63.1	10.3	0.30	55.5	2	59.6	5.00	2	4	5	4	173	
Butte 86	63.5	32.8	82	1	86	12.1	1.53	62.0	10.6	0.33	55.8	2	59.8	3.50	2	4	3	4	170	
SD8089	61.6	29.2	59	3	77	11.4	1.37	62.6	9.8	0.37	53.2	2	57.1	4.25	2	4	3	2	171	
SD3219	64.6	32.9	78	1	90	10.9	1.38	60.5	9.4	0.33	50.8	2	56.6	6.00	2	1	3	1	153	
SD3236	62.9	32.8	67	1	88	12.6	1.48	56.1	10.7	0.26	53.8	2	58.1	5.50	2	3	3	1	160	
SD3249	64.9	30.6	70	1	74	12.5	1.47	61.1	11.3	0.31	54.6	2	58.8	5.00	2	4	3	1	172	
SD8108	63.9	31.2	73	1	63	11.6	1.45	55.9	10.5	0.29	51.9	2	56.0	7.75	2	4	5	1	154	
SBE0050	63.0	31.3	57	3	72	11.3	1.46	53.8	10.3	0.37	55.5	3	59.7	5.50	3	4	3	1	170	
MN91309	62.1	33.0	60	3	83	12.0	1.40	55.5	10.8	0.31	56.5	3	58.5	6.00	3	3	2	1	169	
MN91227	63.5	33.2	79	2	61	11.8	1.51	54.2	10.8	0.35	50.5	1	58.2	4.00	2	3	3	1	166	
MN93413	60.7	32.5	67	2	77	10.7	1.39	54.7	9.0	0.39	52.2	2	58.4	4.25	2	4	5	1	165	
MN93434	63.9	33.8	81	1	74	12.2	1.42	54.5	10.9	0.35	54.3	2	58.5	6.00	2	3	3	1	170	
SBF0402	63.0	32.1	73	2	60	12.3	1.54	50.7	11.0	0.34	54.3	3	58.5	8.00	2	3	6	1	162	
ND691	62.6	27.3	45	2	74	11.3	1.37	51.4	10.2	0.36	55.0	3	59.1	7.00	2	1	6	1	155	
ND692	63.4	28.0	56	3	78	11.9	1.56	60.6	10.2	0.34	51.6	2	57.7	6.25	2	4	6	1	163	
ND694	64.9	30.8	78	1	82	12.4	1.47	57.2	11.6	0.30	55.8	2	60.0	4.50	3	4	5	4	187	
ND695	64.0	31.9	76	2	60	11.8	1.44	54.0	10.9	0.32	53.8	2	57.9	4.00	3	4	3	4	184	

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 29 (cont.)

LOCATION: Selby, SD

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	HARD- NESS	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	C							LOAF VOL (cc)			
						PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)							C	C	G		T						
																						-----Rating-----					
GUNNAR	64.2	29.8	71	3	85	12.4	1.49	57.6	10.8	0.40	53.2	2		59.2	5.00	2	4	3	5		172						
N92-0248	61.9	27.2	47	4	65	12.0	1.54	57.4	10.6	0.32	50.2	1		56.3	4.00	2	4	3	4		165						
N92-0434	63.0	35.6	82	1	72	11.6	1.46	54.0	10.8	0.38	55.3	2		59.4	4.50	2	4	3	4		177						
N92-0126	60.7	32.5	77	1	75	12.4	1.52	54.9	11.3	0.38	55.3	2		59.4	4.25	2	2	6	5		183						
N92-0176	63.0	34.8	85	0	70	11.2	1.45	53.5	10.5	0.39	55.5	3		59.7	4.50	2	5	3	4		174						
MT9311	63.1	28.1	47	2	48	11.7	1.46	44.4	11.1	0.39	56.2	2		60.4	4.25	2	4	3	4		181						
MT9410	63.7	36.4	87	0	104	11.4	1.34	55.0	10.1	0.38	55.8	3		59.9	5.50	2	4	3	5		166						
MT9433	63.0	34.1	78	1	91	12.2	1.42	57.7	10.5	0.38	57.3	3		61.0	4.00	3	5	2	5		181						
T1105	62.8	28.9	36	7	87	11.4	1.45	50.0	9.8	0.40	53.8	2		58.4	6.50	2	4	3	4		166						
T801.93	62.8	37.9	83	1	86	11.6	1.54	42.9	10.3	0.47	58.2	4		62.5	6.50	3	4	3	5		184						
SDM50005	62.6	33.8	77	2	64	12.2	1.52	50.5	11.6	0.38	55.5	2		59.6	3.25	3	4	3	5		180						
FA 994-601	65.1	31.6	70	1	57	12.3	1.47	52.3	11.7	0.30	56.5	3		60.2	4.00	3	3	3	6		178						
BW191	60.8	33.9	82	1	72	12.6	1.48	58.4	11.9	0.36	57.9	4		61.9	5.00	3	3	3	6		187						
9023-FM04C	60.9	32.1	56	4	57	10.9	1.52	53.0	9.5	0.41	51.6	2		55.7	3.25	2	4	3	4		165						

RATINGS:	0						3			6		
	STICKY-WEAK						ELASTIC			BUCKY		
	PIABLE						DULL			CREAMY		
	CRUMB TEXTURE (CT):						OPEN, THICK			FINE		
DOUGH CHAR (DC):	CRUMB COLOR (CC):						COARSE			BRIGHT WHITE		
	IRREG, THICK						COARSE			FINE		
	HARSH									SILKY		

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 30

LOCATION: St. Paul, MN

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR PRO ASH (14 % mb)		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----					LOAF VOL (cc)
						PRO	ASH (14% mb)		PRO	ASH (14 % mb)						D	C	C	G	T	
Marquis	60.1	28.8	59	2	78	16.3	1.99	59.6	15.6	0.49	61.8	4	61.9	3.00	3	3	5	4			203
Chris	59.9	29.3	73	1	87	16.5	1.85	62.0	15.9	0.45	61.4	4	61.4	3.00	3	3	3	5			195
Era	59.8	26.4	48	5	82	14.2	1.88	61.5	12.8	0.46	60.0	4	60.1	4.25	3	3	3	4			192
Stoa	58.2	28.2	47	5	77	15.3	1.92	62.6	14.4	0.44	62.2	5	62.2	4.50	3	3	6	5			196
Butte 86	60.2	34.8	85	0	86	16.3	1.84	60.2	14.6	0.41	63.1	4	63.1	3.00	3	3	6	4			185
SD8089	59.5	32.8	66	3	82	15.2	1.80	63.8	13.6	0.44	61.1	2	61.0	2.50	2	3	5	4			189
SD3219	62.0	33.6	78	2	95	15.0	1.77	62.4	13.7	0.43	60.5	4	60.4	4.00	3	3	5	5			189
SD3236	59.2	31.9	63	2	89	15.7	1.83	58.7	14.1	0.41	60.5	4	60.5	3.00	3	5	3	4			195
SD3249	61.9	32.3	74	1	81	16.1	1.91	62.0	14.9	0.37	63.4	4	63.7	3.25	3	3	6	6			177
SD8108	61.2	32.8	74	1	74	15.3	1.91	61.8	14.1	0.35	62.5	5	62.5	4.50	3	5	3	5			189
SBE0050	59.5	32.3	56	3	73	14.7	1.84	57.3	13.8	0.51	61.1	5	61.3	5.00	3	3	3	5			202
MN91309	61.1	35.8	66	1	85	15.2	1.79	61.4	13.6	0.42	61.4	4	61.5	4.50	3	3	3	5			186
MN91227	59.9	33.1	68	2	64	14.3	1.86	55.4	13.1	0.44	56.9	2	56.7	3.25	3	4	4	4			184
MN93413	60.1	30.7	50	4	85	14.2	1.88	59.1	12.2	0.50	59.6	4	59.6	4.00	3	4	4	5			190
MN93434	62.3	37.2	78	1	90	16.0	1.78	61.5	14.4	0.42	61.8	4	61.8	3.75	3	5	3	5			195
SBF0402	62.1	38.2	87	2	71	15.4	1.73	62.4	14.2	0.39	60.3	5	60.3	5.25	3	3	3	4			190
ND691	61.9	23.9	88	1	83	14.6	1.74	59.5	13.3	0.43	60.8	4	60.8	5.00	3	1	3	4			205
ND692	60.8	29.2	57	4	81	15.3	1.90	61.5	13.7	0.40	60.3	4	60.3	5.00	3	3	3	5			196
ND694	62.2	31.8	76	1	88	16.0	1.84	60.6	14.3	0.41	60.8	4	60.8	3.75	3	3	3	6			198
ND695	62.2	34.8	62	2	85	15.7	1.77	60.1	14.3	0.36	60.0	4	60.0	3.00	3	3	3	5			195

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 30 (cont.)

FARGO, ND																					
LOCATION: St. Paul, MN																					
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX		BAKE ABS	MIX TIME (min)	D	-----Rating-----					
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	ABS	PAT				C	C	G	T		
GUNNAR	60.7	27.8	55	5	91	16.2	1.93	59.3	14.8	0.50	60.5	4	60.5	4.00	3	4	3	6	197		
N92-0248	59.7	25.4	32	10	66	15.3	1.94	61.2	14.4	0.42	58.2	3	58.2	3.25	3	3	4	6	190		
N92-0434	60.6	33.8	78	1	71	14.4	1.76	56.9	13.4	0.43	60.5	4	60.5	4.75	3	4	3	6	196		
N92-0126	58.5	33.1	76	2	65	15.1	2.04	55.9	14.5	0.42	60.5	4	60.5	4.50	3	3	2	5	192		
N92-0176	60.0	36.1	88	2	73	15.3	1.77	61.8	13.2	0.42	60.0	3	60.0	3.75	3	6	3	6	196		
MT9311	60.2	27.9	44	6	60	15.8	1.89	51.4	14.7	0.44	59.6	4	59.6	4.00	3	3	3	5	195		
MT9410	61.8	35.2	81	2	98	14.9	1.84	62.3	13.0	0.42	60.3	4	60.3	4.00	3	5	3	6	187		
MT9433	61.0	32.7	75	2	89	15.8	1.87	60.3	14.3	0.41	63.1	5	63.1	3.50	3	3	3	6	188		
T1105	58.2	22.6	16	16	82	14.8	1.92	55.7	13.5	0.46	59.6	4	59.6	5.00	3	4	3	5	202		
T801.93	60.3	41.8	86	1	94	15.5	1.91	55.4	13.4	0.52	63.4	5	63.4	5.50	3	3	3	6	205		
SDM50005	60.1	31.7	66	3	59	14.7	1.88	58.0	13.3	0.40	56.9	2	56.9	4.00	2	4	2	5	179		
FA 994-601	62.4	36.2	83	2	82	15.8	1.74	59.1	14.7	0.33	59.3	2	59.3	2.75	3	5	2	5	184		
BW191	58.7	33.3	83	1	88	16.9	1.83	56.9	15.5	0.42	62.1	3	62.1	3.00	3	5	3	6	200		
9023-FM04C	59.1	33.6	53	5	51	12.8	1.77	53.1	11.4	0.38	52.9	2	52.9	4.00	2	1	5	1	166		

										0			3			6		
RATINGS:										STICKY-WEAK			PLIABLE			ELASTIC		
DOUGH CHAR (DC):										YELLOW			GREY			DULL		
CRUMB COLOR (CC):										IRREG, THICK			OPEN, THICK			CREAMY		
CRUMB GRAIN (CG):										COARSE			BRIGHT WHITE			FINE		
CRUMB TEXTURE (CT):										HARSH			SILKY					

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USDA / ARS
WHEAT QUALITY LAB

Table 31

LOCATION: Dickinson, ND														FARGO, ND									
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----					LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	C	C						C	G	T			
Marquis	58.7	34.1	86	1	79	14.7	1.56	54.7	13.2	0.43	55.8	2	56.0	4.00	2	3	5	4			168		
Chris	60.3	29.0	68	2	93	15.0	1.42	57.6	14.2	0.39	60.0	3	57.9	3.50	3	3	5	5			180		
Era	61.3	29.4	61	3	76	12.6	1.36	60.5	11.6	0.41	53.8	2	53.8	5.50	2	3	3	4			162		
Stoa	61.1	31.2	71	1	81	14.2	1.39	59.2	13.3	0.36	57.6	3	59.7	4.75	2	5	3	4			172		
Butte 86	62.2	35.1	84	1	83	13.7	1.35	61.2	12.8	0.34	57.6	3	57.6	4.00	2	3	3	5			167		
SD8089	59.1	29.9	53	4	86	13.7	1.29	60.7	12.1	0.39	57.3	2	59.3	5.50	2	4	3	5			168		
SD3219	62.9	31.2	67	2	93	12.8	1.29	62.3	12.3	0.38	55.5	2	55.7	4.50	2	4	5	4			172		
SD3236	62.4	32.1	71	2	74	13.4	1.28	61.0	12.3	0.34	57.6	2	57.6	4.25	2	3	3	4			167		
SD3249	63.4	33.2	75	1	75	14.8	1.38	64.2	14.0	0.33	60.0	3	60.0	4.00	3	5	3	5			180		
SD8108	62.8	36.6	83	0	65	14.3	1.36	53.4	13.4	0.30	55.8	3	57.3	5.50	2	5	3	5			170		
SBE0050	61.6	32.8	64	1	75	13.2	1.30	54.7	12.2	0.35	55.5	3	57.7	5.50	3	5	5	5			175		
MN91309	61.6	38.2	76	1	83	14.1	1.21	62.4	13.3	0.33	59.6	3	60.4	5.00	3	3	2	5			173		
MN91227	61.4	34.5	74	2	64	13.2	1.43	53.2	12.6	0.38	52.9	2	56.9	4.50	2	4	3	4			169		
MN93413	60.1	36.8	73	2	88	12.3	1.28	56.3	10.9	0.39	55.5	2	59.5	4.25	2	3	3	4			168		
MN93434	61.7	37.7	80	1	87	14.2	1.25	62.8	12.9	0.36	58.6	3	58.6	4.50	3	5	3	5			176		
SBF0402	61.7	36.4	86	1	70	14.3	1.37	56.4	13.3	0.37	57.6	3	57.6	6.00	3	3	3	5			190		
ND691	61.0	29.9	65	1	82	13.1	1.37	60.0	12.0	0.39	58.6	3	58.6	5.00	3	4	3	5			177		
ND692	61.4	31.6	66	2	92	13.9	1.40	58.1	12.7	0.39	57.6	3	57.6	5.00	2	4	3	4			182		
ND694	62.5	33.1	82	0	80	15.2	1.44	61.8	14.2	0.36	60.3	4	58.4	4.00	3	3	3	5			188		
ND695	60.1	36.4	90	0	81	14.8	1.29	44.1	13.2	0.35	55.0	2	57.3	4.00	2	3	3	5			187		

LOCATION: Dickinson, ND

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	Rating					LOAF VOL (cc)
						PRO	ASH (14% mb)		PRO	ASH (14 % mb)						C	C	C	G	T	
GUNNAR	61.8	30.9	74	1	100	15.3	1.49	53.4	14.2	0.42	59.0	2	57.0	4.00	2	3	4	5		180	
N92-0248	61.0	27.8	59	2	74	13.6	1.43	57.3	12.8	0.35	53.5	1	53.5	4.00	2	3	3	5		173	
N92-0434	61.6	35.8	83	2	74	13.9	1.47	54.6	12.9	0.34	58.6	3	58.6	5.00	3	4	3	4		192	
N92-0126	58.6	32.8	80	1	67	13.7	1.34	53.9	12.7	0.37	57.3	2	55.4	5.00	2	3	2	4		181	
N92-0176	61.9	40.3	89	1	87	13.8	1.37	57.3	13.0	0.36	58.2	3	56.3	4.50	3	5	2	4		186	
MT9311	61.8	33.9	78	1	65	13.7	1.34	42.5	12.9	0.39	57.6	2	57.6	4.50	2	5	3	4		179	
MT9410	61.8	34.6	78	1	99	14.0	1.26	57.3	12.8	0.36	56.9	3	54.6	5.25	2	5	3	4		182	
MT9433	60.1	37.0	88	0	120	15.4	1.43	49.0	13.7	0.38	57.9	3	57.9	4.00	3	5	5	5		195	
T1105	59.7	34.5	70	1	99	13.7	1.34	44.3	12.0	0.35	55.0	2	57.3	5.50	2	3	3	5		202	
T801.93	62.0	46.1	92	0	94	13.4	1.40	55.6	11.8	0.39	55.5	4	55.5	6.00	6	5	2	5		187	
SDM50005	61.2	37.5	82	1	63	13.6	1.48	50.0	12.7	0.35	55.8	2	55.8	3.50	2	5	3	3		177	
FA 994-601	63.1	34.7	78	1	65	13.6	1.29	55.3	13.1	0.27	56.9	2	56.9	4.00	2	3	3	5		174	
BW191	59.9	35.0	82	1	86	15.1	1.36	60.9	14.3	0.30	60.0	4	58.1	4.50	3	3	3	5		187	
9023-FM04C	63.0	41.3	89	1	73	11.9	1.25	53.2	10.7	0.30	52.2	1	54.5	3.50	1	3	1	1		154	

RATINGS:	0						3			6		
	DOUGH CHAR (DC):			STICKY-WEAK			PLIABLE			ELASTIC		
	CRUMB COLOR (CC):			YELLOW			GREY			DULL		
	CRUMB GRAIN (CG):			IRREG, THICK			OPEN, THICK			COARSE		
	CRUMB TEXTURE (CT):			HARSH			CREAMY			BRIGHT WHITE		
										FINE		
										SILKY		

1996 Spring Uniform Regional Nursery

USDA / ARS
WHEAT QUALITY LAB

Table 32

LOCATION: <i>Powell, WY</i>										FARGO, ND										
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX		BAKE ABS	MIX TIME (min)	D C	-----Rating-----				LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	ABS	PAT				C	C	G	T	
Era	63.1	33.3	78	1	78	10.4	1.59	54.7	8.9	0.41	57.3	2	59.0	2.75	1	4	3	1	153	
Stoa	61.8	32.4	73	2	86	11.3	1.62	54.0	10.3	0.37	60.3	2	62.2	2.75	2	4	3	5	171	
Butte 86	63.0	36.1	89	1	86	11.9	1.60	55.9	10.5	0.37	58.6	2	62.6	2.75	2	3	5	5	158	
SD8089	61.3	33.8	78	1	77	10.9	1.58	57.7	9.2	0.41	53.8	1	57.9	2.50	1	1	1	1	140	
SD3219	63.8	34.7	88	1	83	10.4	1.59	57.7	8.5	0.39	54.3	2	60.4	3.25	1	1	5	4	142	
SD3236	62.5	34.2	78	1	92	11.5	1.68	53.0	9.7	0.38	55.5	2	61.5	2.50	1	4	5	4	143	
SD3249	64.3	36.1	85	1	81	11.6	1.71	58.2	10.0	0.36	55.8	2	61.9	2.50	2	4	5	4	148	
SD8108	63.7	36.6	86	0	68	11.0	1.64	55.2	9.7	0.33	55.5	2	59.4	3.25	2	3	5	4	151	
SBE0050	62.8	34.8	78	0	76	11.1	1.63	51.6	9.7	0.45	55.8	2	60.0	3.00	2	5	5	5	168	
MN91309	62.4	37.3	77	0	88	11.7	1.59	55.9	10.7	0.39	57.6	2	61.5	3.25	2	5	5	5	169	
MN91227	63.4	39.1	90	0	75	11.4	1.65	53.6	10.0	0.39	53.2	1	59.2	2.00	1	5	3	4	153	
MN93413	61.0	38.9	83	0	93	9.9	1.48	56.5	8.4	0.41	52.6	1	60.8	2.50	2	4	5	1	152	
MN93434	63.5	37.9	87	0	87	11.8	1.61	54.2	10.7	0.40	57.3	2	61.2	3.50	2	5	5	5	163	
SBF0402	62.5	36.4	87	2	68	11.5	1.60	55.9	10.7	0.38	55.8	2	59.9	4.00	2	3	3	5	168	
ND691	62.3	32.7	82	1	88	10.9	1.55	53.8	9.6	0.38	55.5	2	59.5	3.00	2	1	5	5	157	
ND692	64.2	33.4	82	0	87	11.6	1.61	55.4	10.3	0.35	56.9	2	60.7	3.00	3	4	5	5	165	
ND694	64.5	31.2	76	1	94	12.2	1.62	56.8	10.9	0.38	59.6	2	63.5	3.00	2	6	3	6	172	
ND695	64.3	33.8	81	1	74	11.4	1.61	54.7	10.6	0.35	57.3	2	61.1	2.75	3	5	5	6	182	
GUNNAR	64.3	31.2	79	1	93	12.2	1.65	58.2	10.8	0.42	59.0	2	63.0	2.00	3	5	3	6	178	
N92-0248	62.9	36.2	84	1	80	10.9	1.59	54.0	10.1	0.41	57.3	2	61.2	2.00	2	1	3	6	176	

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USDA / ARS
WHEAT QUALITY LAB

Table 32 (cont.)

FARGO, ND

LOCATION: Powell, WY

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (mln)	D C	-----Rating-----						LOAF VOL (cc)
					HARD- NESS	ASH (14% mb)	PRO (14 % mb)	EXT (%)	PRO (14 % mb)	ASH (%)						C C	C G	C T				
N92-0434	63.5	35.5	78	1	79	10.9	1.59	53.5	9.6	0.40	55.8	2	60.0	2.50	2	4	3	5		166		
N92-0126	61.8	35.2	89	0	84	11.4	1.59	55.6	10.5	0.35	57.3	2	61.3	3.00	2	3	3	5		164		
N92-0176	63.0	37.5	88	1	85	10.6	1.65	55.6	8.9	0.43	55.5	2	59.7	3.00	2	6	5	4		161		
MT9311	65.7	35.7	84	1	77	10.8	1.53	52.3	9.6	0.39	52.9	1	56.7	2.25	2	5	6	4		144		
MT9410	64.1	36.6	87	1	98	10.3	1.59	54.0	8.7	0.41	54.6	2	58.6	3.00	2	5	5	1		139		
MT9433	63.5	36.6	81	1	99	11.8	1.69	58.2	10.3	0.43	57.3	2	61.0	2.50	2	6	3	6		175		
T1105	63.6	32.8	60	4	91	10.3	1.58	53.1	8.6	0.40	52.6	2	56.7	3.50	2	1	5	4		147		
T801.93	63.0	42.2	84	2	90	10.8	1.66	46.8	9.3	0.49	58.2	2	62.5	4.00	2	4	5	6		171		
SDM50005	63.9	39.2	87	1	79	11.1	1.70	58.4	9.8	0.40	54.3	1	58.4	2.00	2	4	3	1		153		
FA 994-601	64.7	38.6	88	1	87	11.3	1.61	60.2	9.7	0.33	55.3	2	61.3	2.25	2	4	3	1		150		
BW191	63.0	37.2	87	1	80	13.5	1.76	59.1	12.6	0.39	60.3	2	64.4	2.50	3	6	3	6		204		
9023-FM04C	62.5	41.7	81	0	64	10.1	1.54	57.8	9.0	0.41	50.5	1	56.5	2.00	2	4	1	1		137		

RATINGS:		0			3			6		
		DOUGH CHAR (DC):		STICKY-WEAK	PLIABLE	ELASTIC	BUCKY			
		CRUMB COLOR (CC):		YELLOW	GREY	DULL	CREAMY	BRIGHT WHITE		
		CRUMB GRAIN (CG):		IRREG, THICK		OPEN, THICK		FINE		
CRUMB TEXTURE (CT):			HARSH		COARSE		SILKY			

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WHEAT QUALITY LAB

Table 33

LOCATION: Sidney, MT										Rep. 1		FARGO, ND									
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	C C	C G	C T	LOAF VOL (cc)			
						PRO	ASH (14% mb)	FLOUR EXT (%)	PRO										ASH (14 % mb)		
																				-----Rating-----	
Marquis	61.0	28.4	57	2	79	12.9	1.64	60.6	12.1	0.43	54.6	2	56.6	4.50	2	3	3	4	168		
Chris	59.8	23.7	29	7	71	13.7	1.66	62.4	12.8	0.40	56.2	2	60.4	4.00	3	3	3	4	178		
Era	62.3	29.5	56	3	73	11.4	1.53	55.4	10.0	0.42	52.2	2	56.5	5.50	2	3	6	4	162		
Stoa	61.4	28.1	40	4	72	12.2	1.54	58.5	10.8	0.33	56.2	3	60.4	5.25	2	3	5	4	171		
Butte 86	63.0	32.5	75	1	79	11.0	1.62	57.3	9.3	0.37	55.5	2	59.3	4.00	2	4	6	1	147		
SD8089	62.2	29.8	58	3	66	11.2	1.47	57.7	10.0	0.37	53.2	2	57.1	4.50	2	4	3	4	168		
SD3219	65.4	32.4	68	1	77	11.2	1.49	54.2	9.6	0.38	52.2	2	56.4	5.50	2	4	5	5	145		
SD3236	62.7	28.8	35	3	79	11.5	1.38	49.8	9.9	0.31	55.3	3	59.3	5.50	2	4	3	5	163		
SD3249	64.7	30.1	59	1	70	12.5	1.52	55.9	11.5	0.33	56.2	3	60.2	5.00	2	4	5	6	165		
SD8108	63.2	28.4	39	4	52	11.6	1.41	46.0	10.8	0.31	53.8	3	57.9	7.50	2	4	5	4	172		
SBE0050	60.6	27.2	21	8	66	12.8	1.60	44.1	11.9	0.36	55.5	3	59.5	7.00	3	3	3	4	177		
MN91309	62.6	31.7	48	2	83	12.3	1.48	52.8	11.1	0.36	56.5	3	56.4	6.00	2	5	5	6	174		
MN91227	61.8	30.2	62	1	48	11.7	1.50	37.4	10.9	0.37	50.8	2	54.6	5.00	2	4	5	4	160		
MN93413	59.7	28.9	38	6	76	11.4	1.44	44.1	9.7	0.39	55.5	3	59.5	4.50	2	3	4	5	170		
MN93434	62.2	29.9	52	4	77	12.3	1.44	47.4	10.8	0.38	55.3	3	59.0	5.50	2	3	3	4	168		
SBF0402	63.1	33.9	80	0	58	11.7	1.48	45.0	10.4	0.35	52.9	3	56.7	7.50	2	4	6	4	165		
ND691	61.5	24.5	17	10	69	12.3	1.51	45.1	11.6	0.40	58.2	4	62.5	6.00	2	1	5	5	174		
ND692	62.6	29.2	53	3	76	11.6	1.66	55.4	10.0	0.39	50.5	2	56.2	7.00	2	4	3	5	160		
ND694	63.7	27.8	54	1	71	12.2	1.47	49.8	11.2	0.35	59.3	4	63.1	5.50	3	3	3	5	182		
ND695	63.4	30.1	55	3	58	12.7	1.46	50.7	11.6	0.34	60.0	3	61.9	4.00	3	3	5	4	178		

LOCATION: Sidney, MT Rep. 1 FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR PRO ASH (14 % mb)		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	C			LOAF VOL (cc)
						PRO	ASH (14% mb)									C	C	C	
GUNNAR	62.8	25.7	40	4	86	12.9	1.65	53.5	12.2	0.40	58.6	3	62.6	4.50	3	4	3	4	183
N92-0248	61.4	27.6	48	3	59	13.0	1.47	52.1	11.8	0.34	57.6	2	61.5	3.50	3	3	3	6	180
N92-0434	62.8	32.7	74	1	59	11.6	1.60	44.9	10.6	0.38	57.3	3	61.2	5.50	3	4	3	5	180
N92-0126	60.3	30.3	74	2	55	12.0	1.51	41.6	11.0	0.37	59.0	4	63.3	5.00	3	5	5	5	183
N92-0176	63.4	34.1	81	1	71	12.3	1.50	48.6	11.0	0.36	56.2	3	60.2	5.75	2	5	5	5	178
MT9311	63.0	29.2	47	4	51	12.2	1.39	49.3	11.2	0.41	56.5	3	60.4	4.50	3	3	4	5	187
MT9410	62.8	33.2	75	0	78	12.2	1.52	58.3	10.7	0.40	56.2	2	59.9	4.00	2	5	3	5	180
MT9433	61.3	29.8	49	2	78	13.0	1.63	58.9	11.6	0.40	55.8	3	60.0	5.75	2	4	3	5	172
T1105	62.8	30.6	54	3	78	11.2	1.59	52.1	9.3	0.44	53.2	2	57.2	4.25	3	4	3	5	183
T801.93	62.6	37.5	75	1	83	11.8	1.42	52.8	9.8	0.44	57.9	3	61.9	6.75	2	4	3	5	179
SDM50005	61.9	30.2	55	2	59	12.3	1.46	49.5	11.7	0.39	57.9	3	61.9	3.75	3	3	4	5	187
FA 994-601	64.1	29.9	60	1	61	12.3	1.42	44.8	11.4	0.33	56.9	3	60.8	3.75	3	4	3	6	176
BW191	63.3	30.6	64	2	77	12.8	1.61	53.7	11.7	0.41	60.0	4	64.0	5.00	3	3	3	6	193
9023-FM04C	62.4	35.2	73	2	56	10.6	1.48	50.5	9.2	0.38	52.9	2	56.9	4.25	2	1	3	4	157

RATINGS:	0						3			6		
	DOUGH CHAR (DC):			STICKY-WEAK			PLIABLE			ELASTIC		
	CRUMB COLOR (CC):			YELLOW			GREY			DULL		
	CRUMB GRAIN (CG):			IRREG, THICK			HARSH			OPEN, THICK		
	CRUMB TEXTURE (CT):									COARSE		
										CREAMY		
										BRIGHT WHITE		
										FINE		
										SILKY		

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Table 34

LOCATION: Sidney, MT										Rep. 2		FARGO, ND									
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating			LOAF VOL (cc)	
						PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	C						C	C			
Marquis	61.6	27.9	56	1	72	13.7	1.50	51.2	12.6	0.37	58.2	3		58.2	4.25	3	3	5	5	190	
Chris	61.4	25.8	40	4	76	12.6	1.44	50.0	11.8	0.35	57.3	3		57.3	4.25	3	3	4	5	185	
Era	60.5	25.9	26	4	75	12.1	1.41	45.3	10.8	0.39	55.0	3		57.3	6.00	2	4	3	4	170	
Stoa	60.6	26.1	23	6	69	12.4	1.48	48.1	11.4	0.33	56.2	3		58.5	6.00	2	4	5	1	167	
Butte 86	62.4	32.6	75	1	74	11.6	1.39	50.0	10.0	0.35	56.5	3		60.3	4.50	2	5	6	1	161	
SD8089	60.1	27.2	24	4	56	11.6	1.36	42.5	10.4	0.38	53.8	2		57.9	6.50	2	3	6	4	162	
SD3219	63.5	28.5	39	5	65	12.1	1.39	47.9	10.5	0.37	54.6	2		58.7	6.75	2	4	5	5	170	
SD3236	62.2	27.8	22	4	71	12.1	1.31	47.9	10.2	0.30	55.5	2		59.6	6.00	2	3	6	5	172	
SD3249	62.3	28.1	41	3	68	12.6	1.40	51.6	11.3	0.33	55.3	3		59.1	6.50	2	4	5	5	168	
SD8108	62.2	27.9	29	5	47	12.6	1.28	37.7	11.9	0.30	55.3	3		59.1	8.50	2	5	5	5	182	
SBE0050	62.6	29.0	30	3	58	12.2	1.39	40.6	10.9	0.32	57.3	4		61.2	6.00	2	5	4	5	182	
MN91309	61.3	31.9	37	3	69	12.4	1.34	45.5	11.3	0.32	58.6	4		62.7	6.50	2	4	3	5	180	
MN91227	61.3	30.1	51	2	42	11.9	1.46	47.8	10.8	0.35	53.5	2		57.4	4.50	2	1	3	1	172	
MN93413	60.1	30.0	43	3	75	11.2	1.33	41.6	9.5	0.37	55.5	2		59.7	5.00	2	3	5	1	169	
MN93434	61.4	29.5	40	4	78	12.7	1.35	45.1	11.1	0.34	55.3	3		59.3	5.50	2	3	3	4	176	
SBF0402	62.0	30.2	52	2	59	12.6	1.34	43.3	11.8	0.34	54.6	3		58.8	8.00	2	4	3	5	182	
ND691	59.9	24.6	19	2	60	12.6	1.38	47.7	11.4	0.37	57.9	3		61.9	6.00	3	1	3	5	179	
ND692	62.2	27.5	34	4	73	12.8	1.47	50.5	11.2	0.35	54.6	3		58.6	6.50	3	3	3	4	184	
ND694	63.0	28.0	48	4	63	13.0	1.34	49.1	11.9	0.37	59.6	4		63.4	5.00	3	4	3	6	191	
ND695	62.8	30.3	58	2	56	13.0	1.29	49.0	11.9	0.35	57.3	3		61.3	4.00	3	4	3	6	182	

Table 34 (cont.)

LOCATION: Sidney, MT										Rep. 2		FARGO, ND									
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	Rating-----				LOAF VOL (cc)		
						PRO	ASH (14% mb)	EXT (%)	PRO						ASH (14 % mb)						

GUNNAR	62.5	25.2	25	5	76	13.1	1.59	49.1	11.6	0.41	58.2	3	62.5	4.75	3	3	3	6	6	184	
N92-0248	62.2	28.0	51	3	58	12.6	1.40	50.7	11.8	0.37	57.3	2	61.0	3.50	3	3	3	5	5	192	
N92-0434	61.8	30.9	56	2	58	13.0	1.36	44.1	12.0	0.39	63.4	5	59.4	5.75	3	3	5	5	5	207	
N92-0126	61.4	28.5	68	2	60	12.7	1.46	41.9	12.3	0.40	61.8	4	57.9	5.75	3	5	3	4	4	187	
N92-0176	61.4	31.1	68	1	66	13.0	1.41	47.2	11.8	0.38	59.0	4	55.3	6.50	3	6	5	1	1	183	
MT9311	61.5	29.0	42	2	51	12.7	1.32	50.0	11.8	0.39	59.3	3	55.3	4.50	2	4	5	4	4	186	
MT9410	62.7	31.2	56	2	85	13.5	1.45	58.8	11.5	0.41	59.0	3	57.0	4.00	2	3	3	5	5	180	
MT9433	61.4	31.1	57	3	84	12.6	1.37	58.9	11.1	0.40	57.6	3	57.6	5.50	2	5	6	5	5	176	
T1105	62.1	27.7	27	2	80	12.5	1.46	52.1	10.6	0.44	55.8	2	55.8	6.00	2	3	5	4	4	181	
T801.93	62.2	36.8	76	1	77	12.4	1.37	51.4	10.8	0.42	59.0	4	59.0	7.00	2	3	3	4	4	181	
SDM50005	61.1	30.2	41	3	55	12.8	1.43	50.7	11.8	0.39	59.0	3	59.0	4.50	2	3	4	4	4	182	
FA 994-601	63.2	29.6	45	3	54	12.6	1.34	49.8	11.8	0.33	57.6	3	57.6	4.25	2	4	3	4	4	183	
BW191	62.9	28.8	40	4	65	13.3	1.47	54.5	11.8	0.37	58.2	3	56.3	5.50	2	3	3	5	5	184	
9023-FM04C	61.8	33.7	52	3	55	10.9	1.33	47.4	9.9	0.35	57.6	3	55.5	4.00	2	3	3	5	5	174	

RATINGS:		DOUGH CHAR (DC):		STICKY-WEAK		PLIABLE		ELASTIC		BU	
		CRUMB COLOR (CC):		YELLOW		GREY		DULL		BRIGHT	
		CRUMB GRAIN (CG):		IRREG, THICK				OPEN, THICK		FINE	
		CRUMB TEXTURE (CT):		HARSH				COARSE		SILKY	
				0				3			

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WHEAT QUALITY LAB

Table 35

LOCATION: *Williston, ND* FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR EXT (%)	FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----					LOAF VOL (cc)
						PRO	ASH (14% mb)		PRO	ASH (14 % mb)						C	C	C	C	T	
Marquis	61.6	33.2	79	1	86	15.6	1.50	66.9	14.7	0.33	59.3	3	57.2	2.75	2	5	4	4	4	4	193
Chris	60.7	27.2	63	1	94	15.5	1.33	56.6	14.7	0.29	59.6	3	58.5	3.25	3	3	3	3	4	4	192
Era	60.5	27.0	49	4	92	13.8	1.34	60.2	12.8	0.33	56.5	2	56.5	4.50	2	3	3	3	4	4	186
Stoa	60.2	29.6	60	2	87	15.3	1.47	57.9	14.5	0.29	59.3	3	59.3	4.50	3	3	3	3	5	5	188
Butte 86	61.8	32.5	78	1	88	14.7	1.36	58.9	13.3	0.29	58.6	3	58.6	3.75	3	3	3	3	5	5	180
SD8089	59.6	28.8	53	5	79	14.7	1.37	59.9	13.8	0.27	57.6	2	57.6	3.50	2	3	2	3	4	4	186
SD3219	63.6	31.9	71	2	85	14.6	1.34	61.9	13.1	0.34	60.3	3	60.3	4.75	3	3	3	5	6	6	192
SD3236	63.4	31.1	64	4	78	15.7	1.26	61.1	15.3	0.29	59.0	4	59.0	4.25	3	3	2	6	6	6	192
SD3249	61.0	31.6	57	1	83	15.5	1.29	53.8	13.8	0.25	57.9	3	57.9	3.50	2	5	3	6	6	6	181
SD8108	62.2	32.4	67	1	51	14.4	1.24	50.9	13.7	0.26	56.5	3	56.5	5.00	3	3	5	5	5	5	184
SBE0050	61.4	32.2	61	1	67	13.8	1.33	52.6	12.9	0.31	60.0	3	60.0	4.75	3	3	3	3	5	5	182
MN91309	61.0	33.8	63	1	83	15.1	1.35	58.5	14.2	0.30	60.0	4	60.0	4.50	2	3	3	4	4	4	187
MN91227	61.8	33.7	81	1	61	14.3	1.43	54.5	13.6	0.32	53.5	2	53.5	3.50	2	3	5	4	4	4	185
Mn93413	59.7	34.2	69	2	92	13.4	1.34	50.2	11.9	0.35	55.8	2	55.8	4.00	3	3	6	4	4	4	170
MN93434	61.8	32.8	65	1	83	14.8	1.31	57.7	11.9	0.31	57.3	3	57.3	4.00	3	5	5	4	4	4	182
SBF0402	60.6	31.2	70	2	60	15.0	1.36	57.4	14.3	0.32	59.0	4	59.0	5.50	3	3	2	5	5	5	188
ND691	61.3	29.2	63	2	94	14.9	1.34	59.7	13.4	0.33	60.8	4	60.8	4.00	3	3	4	6	6	6	196
ND692	61.0	30.5	60	2	86	14.4	1.38	61.1	13.3	0.31	57.3	4	57.3	5.00	3	3	5	5	5	5	188
ND694	62.4	31.1	68	1	77	15.4	1.37	60.1	14.6	0.30	60.5	3	60.5	4.00	3	3	4	6	6	6	200
ND695	61.8	29.9	72	1	72	15.2	1.34	57.8	14.8	0.28	61.4	3	61.4	3.00	3	3	3	3	6	6	196

Table 35 (cont.)

LOCATION: Williston,ND																					
FARGO, ND																					
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	-----Rating-----			
					HARD- NESS	(%)	PRO (14% mb)	ASH (14 % mb)	PRO	ASH	C	C						C	G	T	VOL (cc)
GUNNAR	62.4	29.1	66	2	92	16.4	1.49	58.2	15.8	0.35	61.1	3			61.1	3.50	3	3	3	6	207
N92-0248	61.6	29.0	63	1	75	15.3	1.47	60.4	14.3	0.30	56.2	2			56.2	3.00	2	3	3	5	188
N92-0434	61.8	37.5	88	1	80	15.5	1.38	55.4	14.3	0.32	59.6	3			59.6	3.50	3	3	3	3	210
N92-0126	58.4	31.2	74	2	70	14.8	1.44	53.3	14.2	0.29	59.0	4			59.0	4.00	3	5	3	3	192
N92-0176	60.9	33.7	82	1	85	14.8	1.35	59.9	14.1	0.28	57.3	4			57.3	4.25	3	3	3	3	193
MT9311	63.4	32.6	74	1	65	14.2	1.31	50.7	13.3	0.30	57.6	3			57.6	3.50	3	6	5	5	187
MT9410	62.2	33.6	81	1	94	14.7	1.28	60.7	13.9	0.30	56.2	2			56.2	4.00	2	3	2	4	183
MT9433	61.6	32.7	75	1	101	16.1	1.42	62.1	15.3	0.31	60.0	4			60.0	3.00	3	3	3	4	195
T1105	61.9	30.5	47	3	94	14.3	1.45	55.7	13.0	0.32	55.8	2			55.8	3.50	2	3	3	5	189
T801.93	61.7	40.0	87	1	86	14.0	1.33	55.9	12.4	0.34	60.0	4			60.0	6.00	3	5	3	6	196
SDM50005	61.4	34.0	76	1	64	14.6	1.47	59.5	13.8	0.30	57.9	2			57.9	3.25	2	3	5	4	178
FA 994-601	63.1	31.6	69	1	54	14.4	1.31	54.0	13.8	0.26	57.3	3			57.3	3.25	2	3	3	5	179
BW191	59.7	29.8	63	2	71	16.3	1.37	58.8	15.5	0.28	60.8	4			60.8	3.50	3	3	3	6	202
9023-FM04C	61.9	37.0	79	1	60	12.9	1.32	56.7	11.8	0.30	55.3	2			59.2	4.00	2	3	5	1	165

RATINGS:		0						3			6		
		DOUGH CHAR (DC):			STICKY-WEAK			PLIABLE			ELASTIC		
		CRUMB COLOR (CC):			YELLOW			GREY			DULL		
		CRUMB GRAIN (CG):			IRREG, THICK			OPEN, THICK			COARSE		
CRUMB TEXTURE (CT):		HARSH									BUCKY		
											BRIGHT WHITE		
											FINE		
											SILKY		

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Table 36

LOCATION: <i>Bozeman, MT</i>														FARGO, ND													
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating-----						LOAF VOL (cc)			
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	C	C						C	G	T							
Marquis	61.3	26.1	42	3	72	15.2	1.35	63.4	14.3	0.36	59.3	3			59.3	3.50	2	3	3	3	6		193				
Chris	60.4	24.8	44	5	76	15.3	1.31	64.2	14.8	0.35	61.4	3			61.4	3.00	3	4	5	5	5		212				
Era	60.9	26.0	40	5	73	13.8	1.25	61.1	12.6	0.36	57.9	2			57.9	5.00	2	4	5	4	4		197				
Stoa	61.8	28.2	48	2	71	14.2	1.19	64.0	13.0	0.29	58.2	3			60.3	4.00	3	3	5	5	5		195				
Butte 86	62.7	31.9	69	1	89	14.4	1.17	62.6	13.4	0.28	59.3	3			59.3	4.00	2	4	5	4	4		180				
SD8089	62.2	26.7	40	4	77	13.0	1.14	63.3	11.8	0.36	57.3	2			57.3	3.50	2	1	3	4	4		182				
SD3219	64.3	29.2	47	3	80	13.4	1.13	65.0	12.7	0.35	57.9	2			57.9	4.25	2	1	5	5	5		186				
SD3236	62.5	29.8	37	2	93	15.0	1.23	57.7	13.2	0.33	57.9	2			57.9	3.00	2	3	3	6	6		178				
SD3249	64.3	30.1	56	2	85	15.0	1.20	65.0	14.7	0.29	60.0	3			60.0	3.75	3	3	5	5	5		194				
SD8108	64.1	32.2	60	1	68	13.9	1.21	61.0	13.3	0.26	57.3	3			59.2	5.00	3	3	5	6	6		192				
SBE0050	63.1	30.1	36	4	69	13.7	1.30	55.9	13.3	0.37	56.9	3			58.9	6.00	3	3	3	4	4		192				
MN91309	62.4	33.9	57	1	83	14.4	1.24	57.0	13.7	0.36	60.8	4			60.8	4.75	2	5	3	4	4		189				
MN91227	61.4	30.7	62	0	59	13.8	1.29	55.2	13.3	0.37	54.3	1			58.2	3.50	2	4	3	4	4		183				
MN93413	60.2	31.2	47	3	85	13.1	1.23	59.7	11.7	0.41	57.6	3			57.6	4.50	2	3	3	5	5		173				
MN93434	62.8	34.2	63	2	82	14.4	1.19	59.7	14.0	0.41	57.6	3			57.6	4.00	2	3	4	4	4		184				
SBF0402	61.9	31.3	55	4	70	14.8	1.30	57.1	14.0	0.38	57.9	4			57.9	7.00	3	3	3	5	5		195				
ND691	59.8	24.6	28	8	76	13.9	1.25	57.0	13.6	0.40	59.3	3			59.3	5.00	3	1	3	5	5		194				
ND692	61.4	27.9	40	4	89	14.6	1.29	60.7	13.7	0.37	60.3	4			60.3	5.00	3	3	3	5	5		194				
ND694	63.1	29.6	61	2	82	15.0	1.14	60.4	14.0	0.36	61.8	3			61.8	3.50	3	3	3	6	6		201				
ND695	62.0	31.7	65	3	66	14.6	1.21	55.7	14.4	0.33	59.3	2			59.3	3.00	3	1	5	6	6		192				

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Table 36 (cont.)

LOCATION: *Bozeman, MT* FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	HARD- NESS	NIR		WHEAT		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	-----Rating-----						LOAF VOL (cc)
						PRO	ASH (14% mb)	FLOUR EXT (%)	PRO	ASH (14 % mb)	D					C	C	G	T			
GUNNAR	63.0	26.8	45	3	87	16.4	1.35	60.5	15.9	0.39	61.1	3		61.1	3.00	3	1	3	5		198	
N92-0248	61.8	27.3	40	3	53	14.4	1.35	61.7	14.2	0.34	56.9	2		56.9	3.00	2	3	3	5		184	
N92-0434	60.9	35.8	80	1	72	14.7	1.26	59.6	14.2	0.36	59.3	3		59.3	4.25	3	3	3	5		197	
N92-0126	57.0	29.3	46	2	76	14.7	1.41	56.9	13.8	0.37	59.6	3		59.6	5.00	3	3	3	5		195	
N92-0176	63.0	34.8	70	0	96	14.6	1.25	61.3	13.5	0.36	60.0	3		60.0	4.00	3	3	5	6		184	
MT9311	62.6	32.8	66	2	61	13.9	1.15	55.3	13.0	0.37	55.5	2		55.5	4.00	2	5	3	5		192	
MT9410	61.8	32.1	62	2	95	14.7	1.20	63.6	14.1	0.37	58.2	3		58.2	3.50	3	3	3	5		187	
MT9433	62.8	33.4	66	2	85	13.9	1.25	63.1	13.0	0.36	57.6	3		57.6	4.25	2	3	5	5		191	
T1105	59.4	27.2	36	8	77	13.5	1.24	57.9	12.5	0.38	55.5	2		55.5	5.00	2	3	3	5		216	
T801.93	62.6	43.7	91	0	87	13.6	1.26	58.6	12.3	0.39	60.0	4		60.0	5.50	3	3	3	5		190	
SDM50005	61.4	32.1	62	3	68	13.6	1.30	61.0	12.9	0.37	58.2	2		58.2	3.50	2	3	5	5		190	
FA 994-601	63.5	31.1	55	2	61	14.4	1.27	58.1	14.2	0.31	57.3	2		57.3	3.00	2	3	5	5		176	
BW191	61.4	32.3	66	2	86	15.6	1.28	60.6	14.8	0.32	59.0	2		59.0	3.00	3	4	5	5		190	
9023-FM04C	62.4	37.7	67	2	61	13.6	1.22	60.4	12.6	0.31	59.3	2		59.3	3.25	2	3	5	5		186	

RATINGS:		0		3		6	
		STICKY-WEAK		ELASTIC		BUCKY	
		YELLOW		DULL		CREAMY	
		IRREG, THICK		OPEN, THICK		BRIGHT WHITE	
DOUGH CHAR (DC):		GREY		COARSE		FINE	
CRUMB COLOR (CC):		HARSH				SILKY	
CRUMB GRAIN (CG):							
CRUMB TEXTURE (CT):							

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Table 37

LOCATION: <i>Havre, MT</i>										FARGO, ND											
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	Rating			LOAF VOL (cc)
					HARD- NESS		PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	C						C	C		
Marquis	60.5	26.4	42	3	79	15.5	1.55		60.9	14.2	0.37	58.2	3		58.2	4.00	3	5	5	4	183
Chris	59.7	25.4	14	8	79	15.1	1.54		61.9	14.5	0.32	57.9	3		57.9	4.50	2	3	5	4	180
Era	59.0	27.3	22	10	76	14.3	1.60		59.1	13.2	0.36	57.3	3		57.3	5.50	2	3	3	4	181
Stoa	59.1	29.0	27	7	75	14.6	1.60		61.5	14.1	0.37	64.7	5		64.7	5.00	3	3	3	5	200
Butte 86	61.8	32.5	65	1	90	15.1	1.43		62.3	14.1	0.34	60.8	4		60.8	4.00	3	3	5	6	175
SD8089	61.9	26.2	17	8	66	14.3	1.51		60.1	13.8	0.37	60.5	3		60.5	5.00	3	4	5	5	183
SD3219	62.7	30.9	42	4	83	14.3	1.45		63.0	13.1	0.38	59.0	4		59.0	6.00	3	4	5	5	176
SD3236	62.2	30.9	47	1	90	15.4	1.46		58.4	13.9	0.34	59.3	2		59.3	3.00	2	5	3	4	174
SD3249	64.1	32.7	46	2	90	15.5	1.47		64.6	15.1	0.30	62.1	4		62.1	3.50	3	3	5	6	186
SD8108	63.0	33.1	58	2	61	14.5	1.66		58.4	14.4	0.43	59.3	5		61.0	5.50	3	3	5	6	190
SBE0050	59.7	27.0	10	8	70	14.6	1.49		52.5	14.1	0.36	58.2	4		58.2	6.50	3	5	3	5	184
MN91309	61.7	34.1	49	2	80	15.0	1.44		60.6	14.3	0.32	61.4	4		61.4	5.00	3	3	5	6	180
MN91227	59.2	37.3	26	5	49	14.9	1.59		54.0	14.3	0.35	59.3	3		59.3	4.00	3	3	3	4	183
MN93413	57.3	27.2	14	10	83	13.6	1.47		59.5	13.0	0.38	60.0	4		60.0	5.75	2	4	3	5	170
MN93434	61.6	33.0	58	2	86	15.4	1.44		63.1	14.3	0.36	61.1	4		61.1	4.25	3	3	5	6	189
SBF0402	59.9	29.3	43	4	63	15.4	1.51		59.9	14.9	0.35	62.7	7		62.7	7.00	3	3	5	6	192
ND691	58.2	22.9	5	17	81	15.2	1.53		61.8	14.4	0.38	61.8	5		61.8	5.75	3	1	5	6	180
ND692	59.9	25.9	20	6	82	14.9	1.54		62.4	14.5	0.33	60.3	7		60.3	7.00	3	4	5	5	186
ND694	61.8	28.5	42	5	85	15.4	1.48		60.9	15.1	0.35	60.8	4		60.8	5.00	3	3	3	6	188
ND695	62.0	30.7	58	4	73	15.3	1.47		60.4	14.4	0.31	59.0	3		59.0	4.00	3	3	3	6	184

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WHEAT QUALITY LAB

Table 37 (cont.)

LOCATION: *Havre, MT*

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D C	C C	C G	C T	LOAF VOL (cc)
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)											
											-----Rating-----										
GUNNAR	61.6	25.9	22	7	83	15.4	1.59	58.6	15.0	0.38	62.5	4	62.5	4.00	3	3	3	6	6	200	
N92-0248	59.0	23.0	7	11	64	15.2	1.62	59.6	14.9	0.40	60.3	4	60.3	4.00	3	3	5	6	6	187	
N92-0434	59.5	29.3	34	5	59	14.8	1.60	51.9	14.5	0.39	61.8	6	61.8	5.75	3	4	3	5	5	197	
N92-0126	57.4	25.7	35	6	64	14.7	1.65	52.6	14.5	0.48	62.7	5	62.7	6.00	3	3	3	6	6	195	
N92-0176	61.6	33.3	71	1	91	15.4	1.59	56.2	14.5	0.37	59.6	4	59.6	5.00	3	5	5	5	5	192	
MT9311	60.6	25.1	14	10	65	14.9	1.53	48.1	14.1	0.35	62.5	6	62.5	5.00	3	5	3	6	6	195	
MT9410	61.4	31.8	49	4	96	15.7	1.48	61.3	15.3	0.31	63.1	4	63.1	3.50	3	4	5	6	6	190	
MT9433	61.9	32.4	59	5	95	14.6	1.44	61.4	13.6	0.31	61.1	5	61.1	4.25	3	3	3	6	6	186	
T1105	58.1	26.8	6	21	79	15.5	1.69	55.1	14.8	0.36	62.1	5	62.1	6.00	3	3	3	5	5	202	
T801.93	59.2	30.9	79	1	92	14.7	1.50	55.9	13.0	0.41	62.1	8	62.1	6.25	3	5	3	6	6	189	
SDM50005	63.4	31.8	44	4	65	15.2	1.60	54.2	14.9	0.36	60.8	3	60.8	4.00	3	3	5	6	6	180	
FA 994-601	62.6	29.9	56	3	65	15.2	1.40	56.1	14.4	0.32	65.1	5	65.1	3.25	3	5	3	5	5	181	
BW191	60.0	32.8	49	4	86	15.6	1.54	59.0	15.2	0.37	65.4	4	65.4	3.00	3	3	3	6	6	205	
9023-FM04C	60.5	26.7	44	2	51	13.3	1.48	52.6	12.8	0.35	59.3	3	59.3	3.50	3	4	5	5	5	177	

RATINGS:	0						3			6		
	STICKY-WEAK			PLIABLE			ELASTIC			BUCKY		
	YELLOW			GREY			DULL			CREAMY		
	IRREG, THICK			HARSH			OPEN, THICK			BRIGHT WHITE		
										FINE		
										SILKY		

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USDA / ARS
WHEAT QUALITY LAB

Table 38

LOCATION: Pullman, WA																							FARGO, ND									
VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR		WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	Rating					LOAF VOL (cc)									
					HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	C	C						C	G	T												
Marquis	58.9	21.9	48	3	80	15.5	1.46	62.7	14.7	0.35	60.3	3	62.5	3.25	3	4	3	4	3	4	182											
Chris	57.6	24.2	16	4	79	15.5	1.41	64.7	14.9	0.35	60.5	3	60.5	3.75	3	1	5	4	180													
Era	59.8	24.1	22	2	82	13.7	1.36	64.2	12.8	0.33	55.5	2	55.5	4.50	2	4	5	4	177													
Stoa	59.7	26.7	13	8	76	14.6	1.29	61.3	13.9	0.31	57.6	2	59.7	4.00	2	1	5	4	184													
Butte 86	59.9	24.0	26	5	83	15.0	1.32	61.5	13.9	0.30	58.6	2	58.6	3.50	2	1	5	4	178													
SD8089	59.5	26.7	16	10	80	14.1	1.23	64.5	12.6	0.31	57.6	2	57.6	3.50	2	1	5	4	188													
SD3219	61.1	28.6	22	7	87	14.4	1.19	60.8	13.7	0.30	57.6	2	57.6	4.50	2	1	3	4	172													
SD3236	61.2	26.6	13	5	88	14.5	1.19	55.7	12.9	0.31	55.8	2	62.1	4.00	2	3	3	4	172													
SD3249	63.5	26.6	16	5	92	14.8	1.19	62.6	14.0	0.34	60.8	3	60.8	3.50	2	4	3	5	177													
SD8108	62.7	29.7	51	3	62	12.9	1.12	57.1	11.9	0.29	55.3	2	59.0	4.75	2	4	3	4	160													
SBE0050	62.9	29.3	34	7	79	12.0	1.17	54.9	11.2	0.33	55.0	2	59.2	6.00	2	4	3	4	159													
MN91309	62.4	32.2	44	2	83	13.2	1.18	55.2	11.9	0.34	57.6	3	59.4	5.50	2	5	3	4	162													
MN91227	62.0	29.8	60	3	64	12.6	1.25	55.2	11.6	0.32	51.3	1	55.1	4.25	2	1	5	4	148													
MN93413	60.1	29.3	32	5	76	12.0	1.20	59.2	10.4	0.36	53.8	2	56.0	4.50	2	4	3	4	152													
MN93434	62.6	29.5	44	2	79	13.0	1.18	54.9	11.3	0.35	55.5	2	59.5	4.75	2	4	3	4	168													
SBF0402	61.6	23.8	47	2	69	13.5	1.22	53.9	12.7	0.34	55.3	2	59.0	6.00	2	4	5	5	177													
ND691	60.3	22.6	13	10	85	13.8	1.21	53.1	12.9	0.36	57.6	3	61.7	5.00	3	1	3	5	182													
ND692	59.9	25.6	7	11	77	14.6	1.33	54.9	13.4	0.34	57.9	3	61.9	4.50	3	3	3	5	191													
ND694	61.8	26.1	25	3	76	15.5	1.19	58.3	14.7	0.34	59.6	3	59.6	3.25	3	1	3	5	200													
ND695	60.6	23.3	35	3	64	14.5	1.18	52.1	14.1	0.30	58.2	2	58.2	3.00	2	4	3	5	192													

LOCATION: *Pullman, WA* *FARGO, ND*

VARIETY	TW (lb/bu)	KWT (gr)	LG (%)	SM (%)	NIR HARD- NESS	WHEAT		FLOUR		FLOUR		MIX ABS	MIX PAT	BAKE ABS	MIX TIME (min)	D	Rating-----							LOAF VOL (cc)
						PRO		ASH		EXT	PRO						ASH	C	C	C	G	T		
						(14% mb)	(14% mb)	(14 % mb)	(14 % mb)														C	
GUNNAR	62.2	22.5	11	7	83	15.6	1.28	55.6	14.9	0.38	60.5	3		60.5	3.25	3	1	3	4	4	190			
N92-0248	59.5	29.8	7	10	74	14.5	1.29	54.5	13.2	0.31	55.0	2		57.0	3.75	2	4	5	4	4	167			
N92-0434	60.5	26.9	48	4	65	14.3	1.16	50.0	13.2	0.29	57.3	3		61.0	4.50	3	1	3	5	5	193			
N92-0126	59.4	29.3	45	5	60	13.7	1.22	46.5	13.2	0.27	57.6	3		61.4	4.50	3	1	3	4	4	181			
N92-M176	60.3	27.1	55	2	83	14.0	1.28	56.8	12.2	0.31	61.8	5		61.8	4.25	3	4	5	5	5	191			
MT9311	62.6	29.9	29	5	63	14.4	1.23	49.8	13.7	0.28	59.0	3		59.0	4.00	3	3	3	4	4	193			
MT9410	61.5	27.0	55	2	91	14.1	1.25	56.8	12.4	0.30	59.6	3		61.7	4.00	3	3	3	5	5	192			
MT9433	60.5	25.2	20	3	93	15.0	1.26	57.1	14.2	0.30	58.6	2		58.6	3.00	3	4	5	5	5	192			
T1105	59.7	26.9	12	11	78	12.8	1.30	51.9	11.8	0.32	53.2	2		59.5	4.75	2	4	3	5	5	169			
T801.93	62.4	26.6	71	1	75	12.5	1.22	48.6	11.1	0.29	56.2	3		60.3	7.00	2	4	4	5	5	176			
SDM50005	61.7	29.3	38	2	63	13.2	1.24	50.5	12.7	0.24	55.5	2		59.5	3.50	2	4	3	5	5	172			
FA 994-601	63.4	28.6	42	2	74	13.3	1.19	50.7	12.8	0.21	57.9	2		57.9	3.00	2	3	3	5	5	177			
BW191	59.7	27.6	40	2	89	15.1	1.27	56.3	14.2	0.29	61.4	3		61.4	3.50	2	4	3	6	6	190			
9023-FM04C	61.4	32.9	53	3	60	11.7	1.09	51.4	10.9	0.24	54.6	2		56.7	4.00	2	1	3	4	4	163			

RATINGS:		0			3			6		
		STICKY-WEAK			ELASTIC			BUCKY		
		YELLOW			DULL			BRIGHT WHITE		
		IRREG, THICK			OPEN, THICK			FINE		
DOUGH CHAR (DC):										
CRUMB COLOR (CC):										
CRUMB GRAIN (CG):										
CRUMB TEXTURE (CT):		HARSH			COARSE			SILKY		

**USDA / ARS
WHEAT QUALITY LAB**

Table 39

REGION: Northeast		FARGO, ND															
VARIETY	TW (lb/bu)	KWT (gr)	NIR		WHEAT		FLOUR		MIX		BAKE ABS	MIX TIME (min)	D				LOAF VOL (cc)
			HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO (14 % mb)	ASH	PAT	C			C	C	G	T	
Std	Butte 86	59.7	32.9	73.6	15.0	1.74	61.8	14.1	0.36	3.2	61.1	3.15	2.4	4.0	3.8	5.6	196.0
	Marquis	55.3	23.1	56.7	13.6	1.84	55.5	12.8	0.46	2.8	58.0	3.90	2.0	3.8	3.6	4.2	176.2
	Chris	58.6	26.2	72.2	15.0	1.72	61.3	14.5	0.38	3.2	61.0	3.40	2.8	3.2	4.0	5.0	194.4
	Era	57.9	26.6	67.0	13.6	1.74	63.3	12.7	0.43	2.6	58.9	3.90	2.6	2.6	3.6	5.0	199.0
	Stoa	57.0	30.0	68.6	15.3	1.84	61.3	14.6	0.39	3.6	61.6	3.65	2.8	3.6	4.4	5.4	199.4
	SD8089	57.7	26.9	63.5	14.5	1.73	59.3	13.8	0.41	2.6	58.5	3.95	2.6	3.6	3.4	4.6	198.8
	SD3219	61.9	30.8	73.4	14.3	1.71	62.1	13.2	0.38	2.6	58.4	4.90	2.4	3.0	3.8	4.8	191.0
	SD3236	60.9	32.2	75.1	14.8	1.70	56.5	13.5	0.37	3.0	59.4	4.15	2.8	4.2	3.0	5.2	192.2
	SD3249	62.5	30.9	67.6	15.0	1.70	58.2	14.3	0.36	3.4	59.8	4.15	2.8	3.4	3.0	5.4	194.6
	SD8108	61.7	33.2	55.7	14.1	1.70	56.8	13.1	0.34	3.5	57.8	5.13	3.0	3.0	4.0	5.3	183.5
	SD8180	59.2	29.2	58.1	14.3	1.83	41.5	13.9	0.37	3.0	59.7	5.00	3.0	3.0	3.0	6.0	193.0
	SBE0050	60.0	29.5	59.5	13.9	1.73	53.5	13.2	0.42	3.6	59.9	4.90	2.8	3.4	4.0	4.8	198.2
	MN91309	59.9	33.4	66.4	14.4	1.68	57.3	13.7	0.38	3.8	60.1	4.35	2.6	4.4	4.2	5.0	189.0
	MN91227	59.4	30.9	53.1	13.7	1.76	57.6	12.9	0.42	1.8	55.2	3.20	1.6	3.0	4.0	4.2	180.6
	MN93413	58.0	32.6	70.4	12.6	1.66	60.7	11.4	0.43	2.4	57.7	3.85	2.0	3.6	4.0	4.2	175.4
	MN93434	60.3	31.9	72.5	14.6	1.70	59.7	13.1	0.38	3.0	58.3	4.30	2.4	3.8	4.2	5.0	187.8
	SBF0402	59.7	32.7	66.4	15.4	1.71	59.8	14.4	0.37	3.6	58.6	4.95	3.0	3.6	3.2	5.6	197.8
	ND691	57.5	25.9	72.1	14.2	1.70	58.8	13.4	0.39	3.4	59.1	4.80	2.6	3.0	3.4	5.8	191.6
	ND692	60.2	27.5	72.1	14.7	1.78	61.7	13.9	0.37	3.4	59.3	4.45	2.8	3.2	3.2	5.8	199.4
	ND694	61.5	30.5	71.9	15.3	1.66	62.4	14.6	0.38	3.2	60.5	3.90	3.0	4.2	3.2	5.6	204.0
	ND695	59.6	31.8	64.7	15.0	1.73	59.3	14.3	0.36	2.6	59.0	3.45	2.8	3.8	3.4	5.6	201.2
	GUNNAR	60.4	27.6	76.0	15.8	1.81	61.3	15.2	0.42	3.2	60.8	3.60	3.0	3.4	3.2	5.4	206.2
	N92-0248	59.2	26.6	59.5	13.9	1.68	61.5	12.9	0.36	1.8	56.3	3.00	2.0	3.8	3.6	4.6	185.6

FARGO, ND																			
VARIETY	TW (lb/bu)	KWT (gr)	NIR		WHEAT		FLOUR		FLOUR		MIX PAT	BAKE ABS	MIX TIME (min)	D C					

RATINGS:	0						3						6					
	DOUGH CHAR (DC):			STICKY-WEAK			PLIABLE			ELASTIC			BUCKY					
	CRUMB COLOR (CC):			YELLOW			GREY			DULL			CREAMY			BRIGHT WHITE		
	CRUMB GRAIN (CG):			IRREG, THICK						OPEN, THICK			FINE					
	CRUMB TEXTURE (CT):			HARSH						COARSE			SILKY					

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USDA / ARS
WHEAT QUALITY LAB

Table 40

FARGO, ND

REGION: Southeast

VARIETY	TW (lb/bu)	KWT (gr)	NIR		WHEAT (14% mb)		FLOUR (%)		FLOUR (14 % mb)		MIX PAT	BAKE ABS	MIX TIME (min)	D				C				LOAF VOL (cc)
			HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	C	C				C	C	C	C	C	T			
Std Butte 86	61.8	34.3	84.7	13.6	1.70	61.9	11.9	0.38	2.5	61.0	3.19	2.0	3.5	5.0	4.8	172.5						
Marquis	60.6	28.2	79.3	13.6	1.71	61.4	12.3	0.42	2.3	59.8	4.06	2.0	2.8	3.5	3.8	175.3						
Chris	61.1	28.3	81.4	14.1	1.66	61.3	13.3	0.40	2.5	61.8	3.50	2.5	3.0	3.0	5.0	179.3						
Era	61.1	28.4	79.9	12.6	1.68	62.2	11.1	0.42	2.5	60.9	4.13	2.3	3.0	3.3	4.3	178.3						
Stoa	60.3	29.6	75.9	13.3	1.69	63.1	12.0	0.38	3.0	60.7	4.50	2.3	3.3	4.8	5.3	181.5						
SD8089	60.5	30.9	77.9	12.7	1.58	64.2	11.0	0.41	2.0	59.0	3.56	1.8	3.5	4.5	3.5	174.3						
SD3219	63.2	33.8	82.2	12.3	1.56	62.1	10.6	0.39	2.5	58.6	5.00	2.3	3.0	3.5	3.5	167.0						
SD3236	61.6	32.9	87.1	13.7	1.65	56.8	11.7	0.35	2.5	60.2	4.25	2.0	4.0	3.8	3.5	170.3						
SD3249	63.5	32.1	76.8	13.9	1.67	59.3	12.7	0.35	2.8	60.5	4.25	2.3	3.5	3.8	4.5	171.8						
SD8108	62.6	32.4	68.4	13.0	1.66	59.1	11.7	0.32	3.0	59.3	6.25	2.3	4.0	3.8	3.8	171.3						
SBE0050	61.5	31.8	70.6	12.6	1.65	57.3	11.5	0.42	3.3	59.9	5.63	2.5	3.5	3.0	3.8	177.8						
MN91309	61.5	34.6	82.6	13.3	1.61	60.9	11.8	0.39	3.3	60.5	4.94	2.8	3.0	2.8	4.0	177.0						
MN91227	61.6	33.3	62.9	12.7	1.68	56.2	11.6	0.41	1.3	57.8	3.75	2.0	3.8	3.8	3.3	167.3						
MN93413	60.2	33.6	81.1	12.0	1.58	58.9	10.3	0.44	2.8	59.1	4.00	2.3	4.0	3.8	4.0	172.8						
MN93434	62.8	35.6	78.0	13.7	1.62	59.6	12.2	0.40	2.8	59.5	4.81	2.5	3.8	4.0	4.3	177.3						
SBF0402	62.0	34.6	66.1	13.6	1.65	58.1	12.3	0.38	3.5	59.3	6.31	2.5	3.8	4.5	3.8	177.5						
ND691	61.7	27.4	79.0	12.7	1.58	57.5	11.3	0.39	3.0	60.7	5.81	2.3	2.0	4.3	4.0	175.8						
ND692	62.3	29.2	78.7	13.0	1.68	61.1	11.3	0.37	3.0	60.2	5.44	2.3	3.5	4.5	4.3	177.8						
ND694	63.0	32.2	82.9	13.8	1.66	59.3	12.5	0.36	3.0	61.9	4.31	3.0	4.3	3.5	5.5	191.3						
ND695	62.8	33.3	71.1	13.3	1.62	57.3	11.9	0.35	2.5	59.3	3.75	2.5	3.5	3.5	5.3	184.3						
GUNNAR	62.8	30.3	87.4	14.0	1.74	59.6	12.5	0.44	2.5	62.6	4.00	2.3	3.5	2.8	5.8	179.3						
N92-0248	60.5	27.0	64.7	13.0	1.71	58.9	11.8	0.37	1.8	57.3	3.50	2.3	3.3	3.5	4.8	173.3						
N92-0434	61.4	35.7	70.2	12.9	1.61	56.8	11.7	0.40	2.5	60.2	4.44	2.3	3.8	3.8	5.0	186.3						

REGION: Southeast		FARGO, ND																
VARIETY	TW (lb/bu)	KWT (gr)	NIR		WHEAT		FLOUR		FLOUR		MIX PAT	BAKE ABS	MIX TIME (min)	D C	C C	C G	C T	LOAF VOL (cc)
			HARD- NESS	PRO	ASH (14% mb)	ASH (14% mb)	PRO	ASH (14 % mb)	Rating-----									
N92-0126	59.4	33.6	67.8	13.5	1.79		56.8	12.6	0.40	2.5	60.0	4.06	2.3	3.8	4.5	5.0	187.5	
N92-0176	61.7	35.3	73.3	12.8	1.65		59.8	11.4	0.40	2.8	59.8	4.31	2.3	5.5	3.5	5.0	183.0	
MT9311	61.5	29.2	53.3	13.4	1.62		49.7	12.5	0.40	2.5	60.7	3.88	2.3	4.0	3.5	4.8	189.8	
MT9410	62.7	36.4	97.1	13.1	1.59		59.6	11.5	0.39	3.0	60.2	4.69	2.5	5.0	3.5	5.3	179.3	
MT9433	61.8	34.2	92.1	13.5	1.66		59.8	11.7	0.41	3.0	61.4	3.75	2.8	4.3	2.8	5.5	184.5	
T1105	60.5	26.6	81.4	12.6	1.64		53.1	11.1	0.43	3.0	59.6	5.50	2.3	4.0	4.0	5.0	180.7	
T1104	60.7	30.1	93.7	13.9	1.79		59.7	12.4	0.38	2.0	59.3	4.00	2.0	3.0	3.0	6.0	195.0	
T801.93	61.7	39.1	86.0	13.2	1.77		52.4	11.5	0.50	3.8	61.9	6.50	2.5	3.3	3.5	5.3	191.3	
SDM50005	61.1	33.3	64.6	13.2	1.71		56.5	12.3	0.38	2.3	59.2	3.50	2.3	3.5	3.5	5.0	180.3	
FA 994-601	63.8	33.9	71.9	13.4	1.63		58.2	12.3	0.33	2.5	60.0	3.44	2.5	4.8	2.8	5.5	182.8	
BW191	59.9	33.8	79.1	14.6	1.73		59.3	13.5	0.41	3.3	61.8	3.88	3.0	4.5	3.0	6.0	201.5	
9023-FM04C	59.7	32.6	52.6	11.8	1.66		55.5	10.4	0.39	2.0	57.0	3.69	1.8	2.5	3.0	3.3	167.5	

RATINGS:										0			3			6		
DOUGH CHAR (DC):		STICKY-WEAK		PLIABLE		ELASTIC		BUCKY										
CRUMB COLOR (CC):		YELLOW		GREY		DULL		CREAMY										
CRUMB GRAIN (CG):		IRREG, THICK		OPEN, THICK		FINE												
CRUMB TEXTURE (CT):		HARSH		COARSE		SILKY												

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USDA / ARS
WHEAT QUALITY LAB

Table 41

REGION: <i>Midwest</i>		FARGO, ND																			
VARIETY	TW (lb/bu)	KWT (gr)	NIR HARD- NESS	WHEAT		FLOUR		FLOUR		MIX PAT	BAKE ABS	MIX TIME (min)	D C	C C	C G	C T	LOAF VOL (cc)				
				PRO (14% mb)	ASH (14% mb)	EXT (%)	PRO (14 % mb)	ASH (14 % mb)	Rating-----												
Std Butte 86	62.5	33.8	82.0	12.6	1.46	56.6	11.2	0.34	2.6	59.7	3.80	2.2	3.6	4.6	3.4	162.6					
Marquis	60.7	30.9	79.0	14.2	1.55	58.3	13.1	0.39	2.5	57.0	3.88	2.3	3.5	4.3	4.3	179.8					
Chris	60.6	26.4	83.5	14.2	1.46	56.7	13.4	0.36	2.8	58.5	3.75	3.0	3.0	3.8	4.5	183.8					
Era	61.5	29.0	78.9	12.1	1.45	55.2	10.8	0.39	2.2	56.6	4.85	1.8	3.4	3.6	3.4	166.6					
Stoa	61.0	29.5	79.1	13.1	1.50	55.5	12.1	0.34	2.8	60.0	4.65	2.2	3.8	3.8	3.8	173.8					
SD8089	60.5	29.9	72.7	12.4	1.41	55.7	11.1	0.36	1.8	58.0	4.50	1.8	3.0	3.0	3.6	164.8					
SD3219	63.8	31.7	80.5	12.2	1.42	56.8	10.8	0.37	2.2	58.3	4.95	2.0	3.2	5.0	4.8	164.2					
SD3236	62.6	30.8	78.5	12.8	1.38	54.6	11.5	0.33	2.6	59.4	4.50	2.0	3.4	3.8	4.8	167.4					
SD3249	63.2	31.8	75.3	13.4	1.46	56.7	12.1	0.32	2.8	59.8	4.30	2.2	4.4	4.2	5.2	168.4					
SD8108	62.8	32.4	56.7	12.8	1.38	48.6	11.9	0.30	2.8	58.0	5.95	2.2	4.0	4.6	4.6	171.8					
SBE0050	61.8	31.2	68.3	12.6	1.45	48.7	11.5	0.36	3.0	59.7	5.25	2.6	4.2	4.0	4.8	176.8					
MN91309	61.8	34.6	81.2	13.1	1.39	55.0	12.1	0.34	3.2	60.2	5.05	2.2	4.0	3.6	5.0	176.6					
MN91227	62.0	33.5	57.9	12.5	1.49	49.3	11.6	0.36	1.8	56.3	3.90	1.8	3.4	3.8	3.4	167.8					
MN93413	60.1	33.8	84.7	11.7	1.37	49.7	10.1	0.38	2.0	59.1	4.05	2.2	3.2	4.6	3.0	165.8					
MN93434	62.1	33.6	82.3	13.2	1.39	53.5	11.5	0.36	2.8	59.1	4.60	2.4	4.2	3.8	4.4	173.0					
SBF0402	62.0	33.6	63.2	13.0	1.43	51.6	12.1	0.35	3.0	58.4	6.20	2.4	3.4	3.4	4.8	178.6					
ND691	61.2	28.2	78.6	12.8	1.43	53.2	11.6	0.37	3.2	60.7	4.80	2.6	2.0	4.0	5.2	176.6					
ND692	62.3	30.4	82.7	12.9	1.50	56.1	11.5	0.36	2.8	58.1	5.30	2.6	3.6	3.8	4.6	175.8					
ND694	63.2	30.2	76.9	13.6	1.45	55.5	12.6	0.35	3.4	61.8	4.30	2.8	3.8	3.2	5.6	186.6					
ND695	62.5	32.1	68.2	13.4	1.40	51.3	12.4	0.33	2.6	60.6	3.55	2.8	3.6	3.8	5.4	185.0					
GUNNAR	62.8	28.4	89.3	14.0	1.57	54.5	12.9	0.40	2.6	61.2	3.75	2.8	3.6	3.2	5.4	186.4					
N92-0248	61.8	29.7	69.2	13.1	1.47	54.9	12.2	0.36	1.8	58.7	3.20	2.4	2.6	3.4	5.4	181.8					
N92-0434	62.3	34.5	69.9	12.9	1.48	50.5	11.9	0.37	3.2	59.8	4.45	2.8	3.6	3.4	5.0	191.0					

FARGO, ND

REGION: *Midwest*

VARIETY	TW (lb/bu)	KWT (gr)	NIR		WHEAT		FLOUR		FLOUR		MIX PAT	BAKE ABS	MIX TIME (min)	D C	C C	C G	C T	LOAF VOL (cc)
			HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)										
N92-0126	60.1	31.6	67.2	12.9	1.47	49.3	12.1	0.36	3.2	59.4	4.55	2.6	4.2	3.2	4.8	181.4		
N92-0176	62.1	35.3	78.7	12.9	1.45	53.7	11.7	0.36	3.2	57.8	4.80	2.6	5.0	4.0	3.8	180.2		
MT9311	63.1	32.1	61.6	12.7	1.38	49.0	11.7	0.38	2.4	57.5	3.85	2.4	4.6	4.6	4.4	176.6		
MT9410	62.7	33.8	90.8	12.9	1.42	57.8	11.5	0.37	2.4	57.3	4.05	2.0	4.2	3.2	3.8	172.8		
MT9433	61.6	33.4	96.3	13.8	1.51	57.4	12.4	0.38	3.0	59.3	4.15	2.4	4.6	4.0	5.0	182.6		
T1105	62.0	31.2	88.2	12.4	1.48	51.5	10.7	0.39	2.0	56.6	4.55	2.2	2.8	3.8	4.6	180.4		
T801.93	62.3	40.5	85.7	12.5	1.44	52.5	10.8	0.42	3.4	59.8	5.95	3.0	4.2	3.2	5.2	182.8		
SDM50005	61.9	34.2	64.0	12.9	1.51	53.6	12.0	0.37	2.2	58.6	3.40	2.2	3.6	3.8	3.4	175.4		
FA 994-601	63.6	32.9	64.4	12.8	1.40	52.8	12.0	0.31	2.6	58.8	3.50	2.2	3.6	3.0	4.2	172.4		
BW191	61.7	32.3	75.7	14.2	1.52	57.4	13.2	0.35	3.4	60.7	4.20	2.8	3.6	3.0	5.6	194.0		
9023-FM04C	62.3	37.8	61.5	11.3	1.38	53.1	10.1	0.35	1.8	56.5	3.55	1.8	2.8	2.6	2.4	157.4		

RATINGS:	0			3			6		
	DOUGH CHAR (DC):			STICKY-WEAK			PLIABLE		
	CRUMB COLOR (CC):			YELLOW			GREY		
	CRUMB GRAIN (CG):			IRREG, THICK			OPEN, THICK		
	CRUMB TEXTURE (CT):			HARSH			COARSE		
							DULL		
							CREAMY		
							BRIGHT WHITE		
							FINE		
							SILKY		

REGION: *West*

FARGO, ND

VARIETY	TW (lb/bu)	KWT (gr)	NIR		WHEAT		FLOUR		FLOUR		MIX PAT	BAKE ABS	MIX TIME (min)	D C C C				Rating-----				LOAF VOL (cc)
			HARD- NESS	PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14% mb)	EXT (%)	PRO				D	C	C	C	T	G	T	C	
Std Butte 86	61.5	29.5	87.3	14.8	1.31	62.1	13.8	0.31	3.0	59.6	3.83	2.3	2.7	5.0	4.7	177.7						
Marquis	60.2	24.8	76.8	<u>15.4</u>	1.45	<u>62.3</u>	<u>14.4</u>	0.36	3.0	<u>60.0</u>	3.58	<u>2.7</u>	<u>4.0</u>	3.7	4.7	<u>186.0</u>						
Chris	59.2	24.8	78.1	<u>15.3</u>	1.42	<u>63.6</u>	<u>14.7</u>	0.34	3.0	<u>59.9</u>	3.75	<u>2.7</u>	<u>2.7</u>	5.0	4.3	<u>190.7</u>						
Era	59.9	25.8	76.8	13.9	1.40	61.4	12.9	0.35	2.3	56.9	5.00	2.0	<u>3.7</u>	4.3	4.0	<u>185.0</u>						
Stoa	60.2	28.0	74.0	14.5	1.36	<u>62.3</u>	13.7	0.32	<u>3.3</u>	<u>61.6</u>	4.33	<u>2.7</u>	<u>2.3</u>	4.3	4.7	<u>193.0</u>						
SD8089	61.2	26.5	74.4	13.8	<u>1.29</u>	<u>62.6</u>	12.8	0.35	2.3	58.5	4.00	2.3	2.0	4.3	4.3	<u>184.3</u>						
SD3219	<u>62.7</u>	<u>29.6</u>	83.3	14.1	<u>1.26</u>	<u>62.9</u>	13.2	0.35	2.7	58.2	4.92	2.3	2.0	4.3	4.7	<u>178.0</u>						
SD3236	<u>62.0</u>	29.1	<u>90.3</u>	<u>14.9</u>	<u>1.29</u>	57.2	13.3	0.32	2.0	<u>59.8</u>	3.33	2.0	<u>3.7</u>	3.0	4.7	174.7						
SD3249	<u>64.0</u>	<u>29.8</u>	<u>88.9</u>	<u>15.1</u>	<u>1.29</u>	<u>64.0</u>	<u>14.6</u>	0.31	<u>3.3</u>	<u>61.0</u>	3.58	<u>2.7</u>	<u>3.3</u>	4.3	<u>5.3</u>	<u>185.7</u>						
SD8108	<u>63.3</u>	<u>31.7</u>	63.6	13.8	1.33	58.9	13.2	0.32	<u>3.3</u>	<u>59.7</u>	5.08	<u>2.7</u>	<u>3.3</u>	4.3	<u>5.3</u>	<u>180.7</u>						
SBE0050	<u>61.9</u>	28.8	72.4	13.4	1.32	54.4	12.8	0.35	3.0	58.8	6.17	<u>2.7</u>	<u>4.0</u>	3.0	4.3	<u>178.3</u>						
MN91309	<u>62.2</u>	<u>33.4</u>	82.1	14.2	<u>1.29</u>	57.6	13.3	0.34	<u>3.7</u>	<u>60.5</u>	5.08	2.3	<u>4.3</u>	3.7	4.7	177.0						
MN91227	60.9	<u>32.6</u>	57.3	13.7	1.38	54.8	13.1	0.35	1.7	57.5	3.92	2.3	2.7	3.7	4.0	171.3						
MN93413	59.2	29.2	81.5	12.9	<u>1.30</u>	59.5	11.7	0.38	3.0	57.9	4.92	2.0	<u>3.7</u>	3.0	4.7	165.0						
MN93434	<u>62.3</u>	<u>32.2</u>	82.6	14.2	<u>1.27</u>	59.2	13.2	0.37	3.0	59.4	4.33	2.3	<u>3.3</u>	4.0	4.7	<u>180.3</u>						
SBF0402	61.1	28.1	67.2	14.6	1.35	57.0	<u>13.9</u>	0.36	<u>4.3</u>	<u>59.9</u>	6.67	<u>2.7</u>	<u>3.3</u>	4.3	<u>5.3</u>	<u>188.0</u>						
ND691	59.4	23.4	80.4	14.3	1.33	57.3	13.6	0.38	<u>3.7</u>	<u>60.9</u>	5.25	<u>3.0</u>	1.0	3.7	<u>5.3</u>	<u>185.3</u>						
ND692	60.4	26.5	82.8	14.7	1.38	59.4	<u>13.8</u>	0.35	<u>4.7</u>	<u>60.8</u>	5.50	<u>3.0</u>	<u>3.3</u>	3.7	<u>5.0</u>	<u>190.3</u>						
ND694	<u>62.3</u>	28.1	80.8	<u>15.3</u>	<u>1.27</u>	59.9	<u>14.6</u>	0.35	<u>3.3</u>	<u>60.7</u>	3.92	<u>3.0</u>	2.3	3.0	<u>5.7</u>	<u>196.3</u>						
ND695	<u>61.5</u>	28.6	67.5	14.8	<u>1.29</u>	56.0	<u>14.3</u>	0.31	2.3	58.8	3.33	<u>2.7</u>	2.7	3.7	<u>5.7</u>	<u>189.3</u>						
GUNNAR	<u>62.3</u>	25.1	84.6	<u>15.8</u>	1.41	58.2	<u>15.3</u>	0.38	<u>3.3</u>	<u>61.4</u>	3.42	<u>3.0</u>	1.7	3.0	<u>5.0</u>	<u>196.0</u>						
N92-0248	60.1	26.7	63.8	14.7	1.42	58.6	<u>14.1</u>	0.35	2.7	58.1	3.58	2.3	<u>3.3</u>	4.3	<u>5.0</u>	<u>179.3</u>						
N92-0434	60.3	<u>30.7</u>	65.3	14.6	1.34	53.8	<u>14.0</u>	0.35	<u>4.0</u>	<u>60.7</u>	4.83	<u>3.0</u>	2.7	3.0	<u>5.0</u>	<u>195.7</u>						

FARGO, ND

REGION: West

VARIETY	TW (lb/bu)	KWT (gr)	NIR		WHEAT		FLOUR		FLOUR		MIX		BAKE		MIX		D		C		C		LOAF	
			HARD- NESS		PRO	ASH (14% mb)	EXT (%)	PRO	ASH (14 % mb)	PAT	ABS	TIME (min)	C	C	G	T	C	C	G	T	C	G	VOL (cc)	
N92-0126	57.9	28.1	66.6	14.3	1.42	1.42	52.0	13.8	0.37	3.7	61.2	5.17	3.0	2.3	3.0	5.0	190.3							
N92-0176	62.3	34.1	93.3	15.0	1.42	1.42	58.7	14.0	0.37	3.5	59.8	4.50	3.0	4.0	5.0	5.5	188.0							
N92-M176	60.3	27.1	83.0	14.0	1.28	1.28	56.8	12.2	0.31	5.0	61.8	4.25	3.0	4.0	5.0	5.0	191.0							
MT9311	61.9	29.3	63.0	14.4	1.30	1.30	51.1	13.6	0.33	3.7	59.0	4.33	2.7	4.3	3.0	5.0	193.3							
MT9410	61.6	30.3	94.1	14.8	1.31	1.31	60.6	14.0	0.32	3.3	61.0	3.67	3.0	3.3	3.7	5.3	189.7							
MT9433	61.7	30.3	91.1	14.5	1.32	1.32	60.5	13.6	0.33	3.3	59.1	3.83	2.7	3.3	4.3	5.3	189.7							
T1105	59.0	27.0	77.9	13.9	1.41	1.41	55.0	13.0	0.35	3.0	59.0	5.25	2.3	3.3	3.0	5.0	195.7							
T801.93	61.4	33.7	85.0	13.6	1.33	1.33	54.4	12.1	0.36	5.0	60.8	6.25	2.7	4.0	3.3	5.3	185.0							
SDM50005	62.2	31.1	65.3	14.0	1.38	1.38	55.2	13.5	0.32	2.3	59.5	3.67	2.3	3.3	4.3	5.3	180.7							
FA 994-601	63.1	29.9	66.4	14.3	1.29	1.29	55.0	13.8	0.28	3.0	60.1	3.08	2.3	3.7	3.7	5.0	178.0							
BW191	60.4	30.9	86.8	15.4	1.36	1.36	58.6	14.7	0.33	3.0	61.9	3.17	2.7	3.7	3.7	5.7	195.0							
9023-FM04C	61.4	32.4	57.4	12.9	1.26	1.26	54.8	12.1	0.30	2.3	58.4	3.58	2.3	2.7	4.3	4.7	175.3							

RATINGS:	DOUGH CHAR (DC):	0						3						6					
		STICKY-WEAK						ELASTIC						BUCKY					
	CRUMB COLOR (CC):	YELLOW						GREY						DULL					
	CRUMB GRAIN (CG):	IRREG, THICK						OPEN, THICK						CREAMY					
	CRUMB TEXTURE (CT):	HARSH						COARSE						FINE					
														SILKY					

